Designing Open and Distance Learning for Teacher Education in Sub-Saharan Africa: A toolkit for educators and planners

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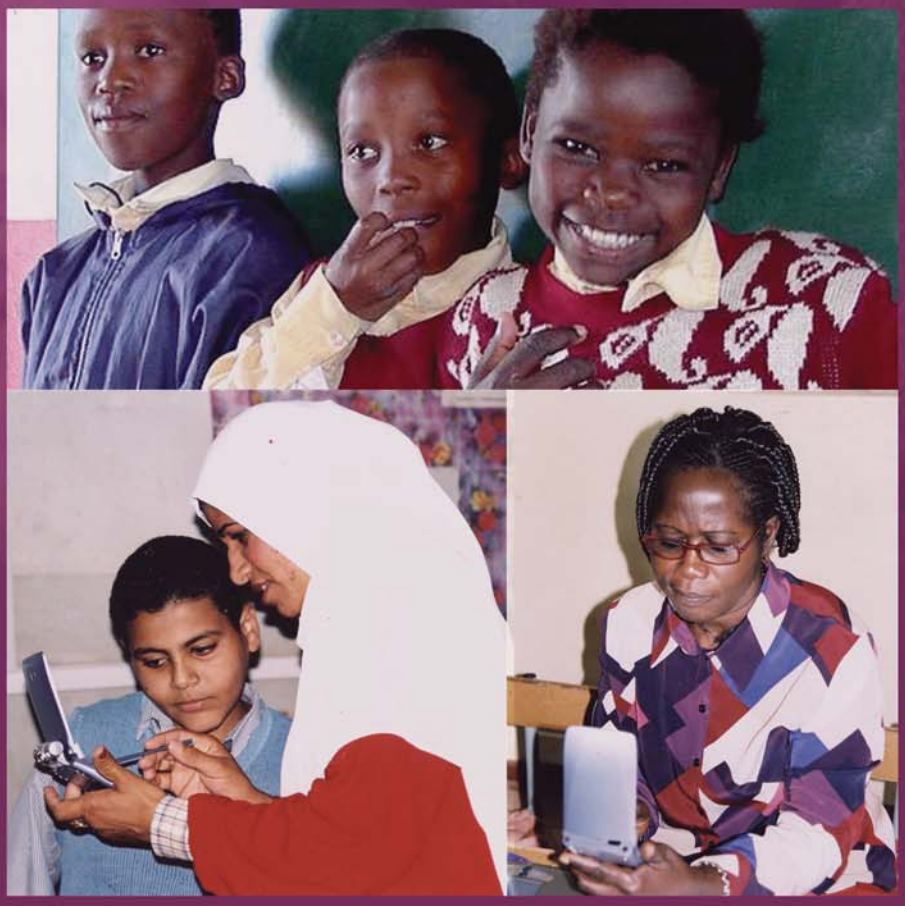
A Toolkit for Educators and Planners



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September 2005

Human Development Sector
Africa Region
The World Bank

The Bank wishes to thank the Norwegian Trust Fund for Distance Education in Africa and the Irish Education Trust Fund for Africa for providing the financial resources to develop this toolkit.

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Please note Icons will be used throughout the text to indicate:

KEY QUESTIONS

Key questions that can inform planning and discussion

KEY MESSAGES

Points in the text that raise key issues for policy makers and planners to track across programme planning and implementation.

ACTIVITY

Activities that can be carried out with a development team or during a planning workshop

DOCUMENT

Documents that support arguments or exemplify the Toolkit with real life practices

POINT FOR DEVELOPMENT

Points for development that provide new ideas that your team may want to consider for the future.

Acknowledgments

The authors would like to express their appreciation to three people who were crucial in developing this publication. Paud Murphy of the World Bank initiated the purpose and framework of this project. His colleague, Shola Aboderin, saw the project through to completion. Her critical reviews of drafts, and those of the World Bank Peer Review Panel—Bob Prouty, Juan Moreno, Mmantsetsa Marope and Rest Barnabas Lasway—were invaluable in the completion of the project. Angie Morgan of Zen Designs (United Kingdom) took charge of overall layout and design.

The authors would like to acknowledge the input from specialists in all parts of the world who provided ideas and inspiration about the ways in which the world's teachers can become better educated and trained in the future. Particular thanks should be given to the participants in three research projects around the theme of teacher education in Africa. First, the Digital Education Enhancement Project (DEEP) funded by DFID; second, the costing and planning toolkit activities funded by the World Bank Irish Education Trust Fund for Africa; and third, the Teacher Education in Sub-Saharan Africa (TESSA) program funded by the Department of Education and Science in England, the Alan and Nesta Ferguson Trust, and the William and Flora Hewlett Foundation. Information about these projects can be found at the Research Group on International Development in Teacher Education website at http://creet.open.ac.uk/rites.cfm.

The authors and publishers also wish to thank the following for permission to use their material: The South African Institute of Distance Education (SAIDE), Document 1; The World Bank, Documents 2, 6, 7, 11, and 12; Taylor and Francis Ltd., Document 3; The Programme Planning and Monitoring Unit (PPMU) of the Egyptian Ministry of Education, Document 4; The Mediterranean Journal of Educational Studies, Document 5; The University of Fort Hare, South Africa, Documents 9 and 10; Educational Leadership, Document 13; and Insights Education, Document 14.

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Foreword

Everyone remembers a good teacher. Good teachers are the key to educational expansion and improvement. In many countries in Sub-Saharan Africa, there is an urgent need to expand the number of primary and secondary teachers. In all African countries, there is an equally important need to improve the quality of teaching. To achieve this, it is clear that new approaches to teacher education are essential. Existing institutions of teacher education will continue to play an important role, but, alone, they will not meet the goals of Education for All (EFA) by 2015.

It is fortunate that, just as the twin needs to improve the quantity and quality of teachers become imperative, so new forms of education and training are becoming available. The world is witnessing a revolution in information and communication technologies (ICTs), which can offer training and support of a type and at a cost hitherto impossible to consider, and thus, must be fully explored given the scale and urgency of demand. In doing so, however, it will be necessary to build on existing and well-tested strategies, including the best models of open and distance learning.

This toolkit is the third in a series of recent publications by the Africa Region Human Development Department of the World Bank to share knowledge and experience on how distance education and ICTs can support education in Sub-Saharan Africa. It emphasizes the rigorous process by which new forms of distance-education programs for teacher education can be planned and implemented. The best models of established programs are considered along with the potential for incorporating, as the means become available, new modes of communication. Most forms of teacher education, particularly those concerned with qualification upgrading and ongoing professional development, will have to be based in schools. The authors demonstrate how school-based programs, appropriately resourced and supported, have the potential not only to raise significantly the number and quality of teachers, but also to improve classroom practice and school organization, generally. The guidance and advice, which is drawn from many years of experience in design and implementation, and embraces a range of case studies from across the region, will be of considerable value to those preparing new policies and programs of teacher education and to those seeking to improve existing programs.

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I Introduction: Open and Distance Learning and Teacher Education

A

A. Introducing the Toolkit

The Challenge

One of the major Millennium Development Goals (MDG) frames the teaching challenge for the next decade:

> ***"…by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling."***

In Sub-Saharan Africa, however, millions of school-age children have no access to schooling; in a small number of countries, fewer than one in four are in school. Giving all children of the appropriate age access to school implies that large numbers of additional teachers must be recruited and trained. However, getting children into school is not sufficient to meet the MDG; children need help to persevere and complete their primary education. One of the main sources of this help is likely to be committed and qualified teachers. Therefore, working teachers need support, unqualified teachers need to be trained, and trained teachers will need career-long professional development and updating. Yet recruiting, and then providing education and training for these teachers, is a significant strategic challenge in many countries. Teaching as a career option has to compete with new sorts of jobs in the growing knowledge economies. HIV/Aids is impacting on the demographic profile of the teaching force. In this context the need to provide new qualification routes into teaching, the importance of upgrading the millions of unqualified teachers, and the ongoing professional support required by all teachers represents a significant challenge of scale and logistics.

Existing systems of teacher education, given this context, will need to change. As new interactive information and communications technologies (ICT) develop, the role of campus-based institutions will evolve (Moon 2000). The demand for teacher education in developing countries is so great that policymakers, program planners, and teacher educators will have to explore alternatives to these existing conventional programs. Open and distance-learning programs (ODL), often 'school-based,' can provide a flexible and effective response to the challenge. Indeed, for many countries, particularly those in Sub-Saharan Africa, they may be the only realistic option, not only for access, but also for system-wide school improvement. Open and distance learning can provide high-quality, sustainable, and cost-effective programs at the classroom or institutional level.

B. Defining Open and Distance Learning

Open learning is an approach that provides learning in a flexible manner, organized around the geographical, social, and time constraints of the learner rather than an institution (Bates 1995:27).

Distance education is a means to that end. It is "an educational process in which a significant proportion of the teaching is conducted by someone removed in space or time from the learner" (Perraton 1993: 63).

The combination of the approach, open learning, with the method, distance teaching, is called ***open and distance learning***. This term will be used throughout the toolkit.

When combined with ICT in a well-designed, local school-based support system, open and distance learning can meet the challenges that education systems in developing countries are facing today.

C. Overview of the Use of the Toolkit

This toolkit comprises ten **modules** that can be used for planning and training activities associated with designing open and distance-learning programs for teachers. The ten modules are grouped in linear form around the four stages through what most programs develop:

- scoping
- initial development
- program start-up
- evaluation.

Each module addresses key questions that must be answered in the design process. Accompanying each module are a set of **instruments** that can be used for collecting the necessary data and **documents** that provide ideas and case study information to inform debate around design decisions. These documents and other case study and project references in the toolkit use examples from Sub-Saharan Africa and, to draw on the widest possible scenarios, from other parts of the world. These are grouped by module in Section 10 at the end of the toolkit.

The toolkit has been created from the experience of developing a wide range of open and distance-learning teacher education programs. Some important points need to be made at the outset.

First, the toolkit follows a linear form from scoping through to evaluation. In practice, program design is often an iterative process. Decisions made at the scoping phase, for example, may have to be revisited if the program start-up activities suggest changes to the original plans. The toolkit addresses the same questions at different phases but it does so in ways that continuously burrow down to a greater level of detail. Any design activity is strengthened by such flexibility. However, it is also very clear that well-managed and well-thought-through programs, with due consideration given to each aspect of design, save time and resources and lead to a higher-quality learning experience for the teacher. Neglect of any phase of development risks undermining the purposes and ambitions for the program.

Second, it is rare that one person or group takes the design through all the stages. The toolkit, therefore, provides a constant in the design process. If used effectively it will provide a growing foundation of information and decision-making that others will build on.

Third, and following from the second point above, different parts of the toolkit are likely to engage different stakeholders in the design process. For example, the scoping modules might engage national and institutional policymakers more than the modules concerned with decisions about materials design or support structures. In practice a range of individuals contribute at all stages. Each module, however, has an overview which includes suggestions about the type of people that most likely need to be involved.

Fourth, most of the experience from which this toolkit has been created has been with programs that work to scale. This would normally be with thousands rather than hundreds of trainees. Well-designed programs working to scale are proving effective in Sub-Saharan Africa and these need multiplying. However, the design process set out in the toolkit could be applicable, if the cost structure permitted, to any size program. The structure set out in the toolkit has worked successfully with national programs with an excess of a hundred thousand trainees and more local institutional provision with much smaller numbers.

Fifth and finally, the toolkit is about designing programs. It does not aim to cover the detailed logistics, for example, of instructional materials or assessment instruments. The focus here is on ensuring the design processes and decisions are appropriate, robust, and take account of the latest developments in the field.

The toolkit also includes an **Annotated Bibliography** and Website References that guide users to the wider range of resources around open and distance learning. A Glossary of terms is also provided.

Figure 1

Framework of the Toolkit

The framework indicates key questions raised in each module and, where provided, the associated instrument and/or document.

PHASES OF PROGRAM DEVELOPMENT	TOOLKIT INSTRUMENTS	SUPPORTING DOCUMENTS (*=re-use of instrument)
SCOPING A PROGRAM		
MODULE 1: **How is the purpose of the program defined?**		
1. What purpose should the program meet?		
2. What is the focus of the program?		
3. How many teachers or teacher trainees are needed?		
4. How does the program fit into existing education-policy priorities?	INSTRUMENT 1: A chart for reviewing national strategies toward open and distance learning	***DOCUMENT 1: Three scenarios for teacher education offered at a distance***
MODULE 2: **What information about the existing teacher-education context is needed?**		
1. What already exists?	INSTRUMENT 2: Pre-service education and training program: a review INSTRUMENT 3: In-service qualification-upgrading program: a review INSTRUMENT 4: Continuing professional development (CPD) programs: a review	***DOCUMENT 2: Uganda: a response to teacher supply*** ***DOCUMENT 3: Contemporary ideas about a third age of school-improvement practice*** ***DOCUMENT 4: The Educational Enhancement Program for primary teachers in Egypt*** ***DOCUMENT 5: Albania's Kualida Program for the CPD of teachers***
2. Can existing infrastructures be re-used for this program?		
3. How should the program relate to relevant interest groups and other providers?	INSTRUMENT 5: Stakeholder grid	
MODULE 3: **What is the composition of the budget?**	INSTRUMENT 6: Cost-analysis spreadsheet	***DOCUMENT 6: Comparative costs of open and distance learning and conventional teacher-education programs***
Conclusion to scoping a program	INSTRUMENT 7: Scoping a program: key questions	

PHASES OF PROGRAM DEVELOPMENT	TOOLKIT INSTRUMENTS	SUPPORTING DOCUMENTS (*=re-use of instrument)
INITIAL DEVELOPMENT PHASE		
MODULE 4: **What information from the Scoping Phase needs elaboration?**		
1. What are the basic parameters of the program?		
2. Who is the target audience?	INSTRUMENT 8: Learner profile	
3. What is the likely duration of the program?		***DOCUMENT 5: Albania's Kualida Program for the CPD of teachers**
4. How long will it take to set up the program?		***DOCUMENT 4: The Educational Enhancement Program for primary teachers in Egypt***
MODULE 5: **What elements should be included in a preliminary design?**	** INSTRUMENT 6: Cost-analysis spreadsheet*	
1. Materials: What are the types and functions of the resources to be developed?		
2. Project Support: What is the nature and role of a preliminary staff structure?		
(a) What criteria should be used in appointing a Program Director?		
(b) How should a program team be set up?		***DOCUMENT 7: An overview of the management and administration of teacher-education programs using open and distance learning***
(c) What type of training is necessary for staff working on the program?		
3. Assessment: What forms of assessment are envisaged?		
4. Quality Assurance: What processes for ensuring quality are to be put in place?	INSTRUMENT 9: Design evaluation	
5. What elements should be included in a preliminary costing plan?	** INSTRUMENT 6: Cost-analysis spreadsheet*	***DOCUMENT 9:*** ***DOCUMENT 13: Exploiting the potential of electronic conferencing in developing open and distance-learning courses for teachers***
PROGRAM START UP		
MODULE 6: **What are the options for curriculum-organization models?**		***DOCUMENT 8: Teacher knowledge and the design of open and distance-learning courses and programs*** ***DOCUMENT 9: Description of Fort Hare University, B.Prim. Ed. Program***
MODULE 7: **What are the Specifications for Determining Open and Distance-Learning Materials?**		
How can the study materials be classified? How can school-based activity be included in the program?	** INSTRUMENT 8: Learner profile*	***Document 10: Sample pages from Fort Hare University, B.Prim. Ed. Program, teacher-learner text***

PHASES OF PROGRAM DEVELOPMENT	TOOLKIT INSTRUMENTS	SUPPORTING DOCUMENTS (*=re-use of instrument)
INITIAL DEVELOPMENT PHASE		
What are the options for delivering course materials?	INSTRUMENT 10: Selecting course materials and technologies	***DOCUMENT 11: Interactive Radio Instruction*** ***DOCUMENT 12: Chile's Learning Network*** ***DOCUMENT 13: Exploiting the potential of electronic conferencing in developing open and distance-learning courses for teachers*** ***DOCUMENT 14: Missing the Connection? Using ICTs in Education***
MODULE 8: **What is the nature and role of the local support structure?**		**** DOCUMENT 13: Exploiting the potential of electronic conferencing in developing open and distance-learning courses for teachers***
What are the potential sources of support? What characteristics should support structures exhibit?		
MODULE 9: **What systems of assessment and quality assurance can be put in place?**		
1. What are the options for participant and teacher assessment?		
2. What are the options for quality assurance?	INSTRUMENT 11: Process evaluation	
MODULE 10: **What are the options for evaluating a distance education program for teacher training?** 1. What forms of evaluation should supplement the quality-assurance framework?		
2. When should the program be evaluated?	**INSTRUMENT 11: Process evaluation*	
3. What criteria and indicators should be used to judge effective implementation, especially in terms of the impact on teaching and learning?	INSTRUMENT 12: Criteria for judging the elements of open and distance-learning programs in teacher education.	

II Scoping an Open and Distance-Learning Teacher-Education Program

Contents

Overview of modules

Overview of Modules 1–3

The questions posed in these preliminary modules come at the very outset of program planning. At this stage those involved should almost certainly involve key policymakers and lead planners supported by educators who have a knowledge of teacher education and training needs. Successful programs need the sustained understanding, commitment to, and support of key policymakers at the outset. Such support, although exercised less directly, will also be required subsequently. Most open and distance-learning programs for teachers are innovatory in the context implemented and therefore attract pressures from the conventional modes of provision. A recent example to illustrate this can be found in the Sudan. The teacher education programs of the Open University of Sudan, targeted at upgrading the qualifications of over one hundred thousand primary teachers. It depended critically on policy-level support sustained over time from the Ministries of Education and Higher Education. This influence was exercised through hands-on direct involvement in the scoping phase of development and subsequently through ministerial-level involvement on the board of the University.

This scoping phase need not take long, but it does involve bringing together the appropriate mix of expertise, including those who may have initiated similar programs elsewhere. At this scoping phase consideration must be given to the size and composition of the budget. In particular, if start-up resources are coming for external sources such as donors, questions of financial sustainability need addressing. The issue of costs often drive the iterative process of project design referred to in the toolkit overview. At this stage preliminary ideas about building a budget can be made but these may have to be revisited when more detailed budgeting work takes place at later stages of the design process.

Module 1 How Is the Purpose of the Program Defined?

Successful implementation of an open and distance-learning approach requires a clear identification of purpose from the outset. To help clarify the purpose of a program, a number of more detailed questions must be considered.

1

1. What Purpose Should the Program Meet?

Open and distance methodologies can be applied to an extensive range of courses and purposes in teacher education. One of the first decisions to be made is what type of program is required. Most teacher education falls into one of three categories: (1) pre-service education and training, (2) in-service qualification upgrading, and (3) continuing professional development (CPD). Each of these categories can have very different requirements and educational approaches. For example, a short- or medium-term program that trains new teachers will have different requirements than an ongoing program that updates teachers' knowledge and skills. Some additional questions to determine the appropriate program include:

KEY QUESTION

- Which category of teacher education is appropriate: pre-service training, in-service qualification upgrading, or CPD?
- Is the program envisaged as a one-time offering or an ongoing program?
- Will the program be mandatory for all teachers or optional?

In many Sub-Saharan countries the urgent need is to upgrade the qualification level of unqualified or underqualified teachers, particularly in the basic education sector. In that context programs involve a blend of pre-service, in-service, and CPD and this may involve, where programs are operating at a regional or national level, coordinating different departments of a national or regional ministry. This is one reason why the overview for modules 1 and 2 stresses the need to involve all key policy stakeholders, not merely those who have direct responsibility for scoping the program.

2

2. What Is the Focus of the Program?

It is extremely important to identify the purpose of a program. In many countries, as indicated above, programs often need to focus on untrained

or underqualified teachers with substantial weaknesses in basic subject knowledge. Such teachers need to continue with their daytime jobs and study part-time. For such programs, primary teachers, who are responsible for teaching a range of subjects, are likely to be a particular concern.

KEY MESSAGE

In the past many programs sought to upgrade teachers' subject knowledge. Such programs may have also offered teachers higher levels of qualification. Many of these courses, however, gave little or no attention to the pedagogic context in which teachers were working and, therefore, failed to have any real impact on their teaching. Therefore, it is important that the focus of the program respond to a specific need, but within the context of improved overall quality of instruction. The University of Fort Hare in the Eastern Province of South Africa sought through an open and distance-learning program to respond to the needs of over 130,000 underqualified teachers in the province. The university worked in cooperation with the provincial government to develop a school-based upgrading program which involved primary teachers specializing in the areas of science, mathematics, and technology, areas of subject expertise significantly underrepresented in the primary teaching force.

Such a pedagogic focus does, however, require some local support and supervision, which increases costs and may decrease the number of teachers that can be accommodated in the program. It is, therefore, crucial at the preliminary scoping phase to establish the curriculum focus of the program and the study-time requirements of the curriculum.

3 3. How Many Teachers or Teacher Trainees Are Needed?

When the type and focus of the program have been established, preliminary target numbers should be set. This can raise a number of issues. Open and distance-learning programs are most cost effective at a large scale. The majority of such programs would need to target a minimum of 500–1,000 teachers. If the program is undertaken in a place with little ODL experience, a pilot program with far fewer teachers may be undertaken. However, it should be noted that while a pilot program may provide feedback on the materials and the requirements of an assessment system, it does not specify the sort of infrastructure needed for large programs.

Basic information about the number of participants entering and completing training courses is often widely available. Many countries now have reliable data on the number of unqualified or underqualified teachers

in schools. There is information about the number of trainees who enter teaching, and the time they remain in teaching. Conversely, few countries hold accessible data on the CPD experience of teachers. At the outset some idea of the throughput of teachers expected will be necessary. These preliminary ideas should be tested against subsequent considerations of costs and logistics:

- How may certified or upgraded teachers are needed by the education system?
- How many people, at a minimum, would participate in the program?
- How many people, at a maximum, need to participate in the program to produce the overall number of teachers required?

4

4. How Does the Program Fit into Existing Education-Policy Priorities?

KEY MESSAGE

Given the pressures on education systems, teacher education can be a point of political contention. For this reason, thought must be given to aligning a new open and distance-learning program with current education-policy priorities. It is at this juncture that careful thought and advocacy may be most consequential. The extent to which the program's goals address current educational policy goals will ensure support from both policymakers and education officials. This support can be crucial in the early stages of program development and for long-term sustainability.

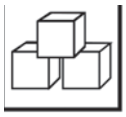
(i) New programs, particularly less costly ones, may threaten the established role of the teacher educator, especially those involved in traditional pre-service training. This may be especially true where teacher education has been incorporated into or associated with institutions of higher education. Governmental pressures to increase the supply of teachers and upgrade the qualification base through innovative approaches such as ODL may conflict with traditional university structures and erode the autonomy often granted to such institutions.

(ii) A key decision for program planners should be the extent to which new programs should remain independent of existing institutional structures. Autonomy of the program must be balanced against the advantages of integration. Independence gives program developers freedom from traditional rivalries. Ownership by existing institutions may provide greater opportunities for sustainability. There are dangers in both scenarios: Independent programs will be terminated

when external funding ceases; programs affiliated with existing institutions may have to struggle to attain status and attract superior staff.

(iii) Program planning must stay abreast of reforms in teacher-education regulations. It would, for example, make little sense to produce an expensive range of materials and then discover they do not address the requirements of a new set of government regulations. That said, the teaching profession is subject to repeated reviews, and programs must have the flexibility to respond to changing circumstances.

(iv) The sources of financial support may determine certain goals and priorities. Donor organizations may have criteria that need to be considered. In recent years, for example, many donors have been particularly interested in developing mathematics, science, and technology teaching at the primary level.



POINT FOR DEVELOPMENT

(v) Another key decision for program planners should be the target qualification level of the trainees. Some variables to consider may include the length of the program versus the number of participants that can be accommodated. Another problem for upgrading programs is the insistence by some university authorities that one year of full-time study cannot be completed in less than two part-time years. The flexibility of such determinates may vary from context to context. Another issue may be the willingness of authorities to incorporate Accreditation of Prior Learning (APL) into program design.

To determine how the program fits into existing education-policy priorities, the following should be kept in mind:

- Which institutional or political pressures may bear on the program?
- Who are the major stakeholders, who, directly or indirectly, will influence the development of the program?

Two useful figures for orientating thinking in this area, drawn from a report to the UK's Department for International Development by Juan Manuel Moreno, have been reproduced, with the author's permission, below. These figures highlight the links among teacher education, entry to the profession, teacher incentives, and external supports, including school improvement policies. The issues identified in the matrices indicate the wider arena that may require consideration at the formative scoping phase.

Figure 2

Teacher Education and Professional Development Setting Up the Specific Issues

Teacher Supply	Teacher Competence	Teacher Development
■ Recruitment strategies ■ Retention strategies	■ Minimum standards and competences ■ Pre-service teacher training and accreditation ■ Strengthening outcomes-based teacher assessment and inspection	■ Teacher development and external support ■ In-service training ■ Professional Associations and Teachers' Unions

Figure 3 Policy Framework for Teacher Development

	Quality Assurance (QA)	Teacher Professional Development	Management	Incentives
Teacher Preparation	Instruments to control the quality of TTIs (accreditation, program evaluation)	Conditions for successful initial teacher education reform (ISE or other)	Deployment of staff and supervision of interns	Competitive fund Local recruitment of teachers
Entry into the Profession	Instruments to clarify what is a good teacher and to screen entrants into the profession (certification)	Mentoring and tutoring	School leadership and supervision of inductees	Incentives for hardship posts (remote, rural, and post-conflict)
Teacher Career	Instruments to guide continuous school performance and teaching improvement (census-based testing, school reviews, teacher periodic evaluation and re-certification)	Structures and processes that promote continuous teacher learning (support, networks) School development plan	QA teams (School Council) (Community relations)	Selective salary incentives Merit awards to schools Non-monetary rewards Pension policy

Document 1 can be used to stimulate a dialogue among policymakers at the early stages of program design. In most contexts this means incorporating the often new provision into existing structures. Document 1 discusses the challenge of moving to such integrated systems. The document focuses on national strategies but similar issues and questions could be raised at a regional or institutional level.

1

DOCUMENT

Document 1

Three Scenarios for Teacher Education Offered at a Distance

DOCUMENT 1

Instrument 1 can be used to review issues and questions in a national context.

1

ACTIVITY

Instrument 1

Reviewing national strategies toward open and distance learning

INSTRUMENT 1

Module 2 What Information about the Existing Teacher-Education Context Is Needed?

Open and distance methodologies are applied to an extensive range of courses in teacher education. In many contexts ODL has co-existed with more conventional institutional forms of provision. The success of past efforts and existing expertise to use open and distance methodologies can guide present attempts. Current needs, potential resources, and past experiences should determine ODL methodology.

There are a multiplicity of teacher-education systems offering varied means to achieve common goals and qualifications. Additionally, among ODL applications, the information required to determine viability differs with the nature of the program. Costs may also be difficult to determine.

1

1. What Already Exists?

An inventory of existing teacher-education programs can expose the needs that must be addressed by a new program. This can also reveal the larger context in which teacher education is being conducted. Discussion should focus on the question: In the context of existing provision, which need is addressed by the new program?

- Does it replace a form of existing provision?
- Does it extend provisions already in place?
- Does it develop existing provision to meet current requirements?

When considering teacher-education and training resources, differences among the types of programs become apparent. For example, the focus and duration of pre-service training is likely to be quite different than CPD training. Each type of program is discussed below. In national systems they may come under different ministries or different sections of a Ministry of Education.

(a) *Pre-service Education and Training:*

In most countries, institutions of higher education play an important role in teacher training. The latter part of the twentieth century saw a shift, in most parts of the world, to raise the basic qualifications for teaching

to degree level. Degree, license, or graduate level has since become a benchmark to measure the extent of qualifications. Traditionally, many teachers, particularly primary teachers, were accredited at lower levels. In a number of countries of Sub-Saharan Africa, for example, the Certificate and Diploma levels precede the Bachelor of Education level.

Although some countries, South Africa for example, have reformed this structure, the model set out in **Figure 4** is representative of many education systems.

In most countries, specialist teacher-training colleges that focus on primary training have existed alongside universities. However, there is currently a trend to phase out teacher-education institutions. In South Africa, for example, a national reform program has integrated teaching colleges into the university sector. The same is true in Sudan.

Local context is also important to the extent that regional or national authorities impose a regulatory framework for teacher education. The regulations may specify certain course requirements or training outcomes, and a framework may provide important parameters in program design. All over the world, there is now a greater tendency to address issues of quality in training. The responsible institutions, in this regard, may be governmental or regional, or the assessment may be through an internal sectoral process.

In some contexts the extent to which minority communities are represented in the teaching force can be an issue. New open and distance-learning programs may be able to assist in ameliorating imbalances, for example, by providing easier access to training programs.

Figure 4

Length of Study and Levels of Teacher Qualification Often Found in Sub-Saharan African Countries

Certificate level	Two years of full-time study
Diploma level	Three years of full-time study
Bachelor of Education Degree level	Four years of full-time study

Instrument 2 can be used to discuss the existing context for pre-service training.

2

ACTIVITY

Instrument 2

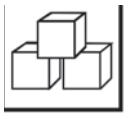
Pre-service Education and Training Program: A Review

INSTRUMENT 2

(b) *In-service Qualification Upgrading:*

Much of the foregoing commentary about pre-service programs also applies to in-service-qualifications upgrading, but there are some additional considerations, particularly in many Sub-Saharan African country contexts. Such programs are generally organized as part-time versions of the full-time local equivalent. One-year's full-time study is replaced by a two-year part-time equivalent. Courses focus on raising qualifications of individual teachers, not on the larger impact on classroom practice or on the school as a whole. Prior learning is rarely recognized by these programs, and the teachers, irrespective of their experience and skills, must fulfill rigid and often arbitrary requirements. Still, there is financial motivation for training, as salary increments accrue from increased levels of qualification. Quality assessment is often overseen by university authorities.

Important considerations in developing new ODL programs include the following:



Development

POINYTS FOR DEVELOPMENT

(i) The length of the program must be carefully reviewed.

- Does every teacher, regardless of experience, require the same length of training?
- Does the program grant Accreditation of Prior Learning (APL) of teachers and allow them to enter the program at a more advanced level?

Keeping these criteria in mind will make programs more responsive to the needs of individual teachers and free up resources for upgrading teacher qualifications.

(ii) The design for upgrading courses is often derived from the college or university sector. Although the outcomes should be comparable in terms of standards and quality, the logistics of ODL usually require different structures and forms of organization.

(iii) Open and distance-learning approaches are appropriate for upgrading teachers' qualifications. The costs of foregoing teaching salaries as well as the issues of family and personal obligations and distance limit attendance at conventional courses. School-based upgrading programs address school-improvement issues, generally, and standards of pupil attainment, specifically. This approach, if well coordinated at the local level, can afford significant benefits to the program. New programs offer more opportunities for integrated partnerships between universities that traditionally upgrade courses and regional education departments that target professional development and school improvement.

Instrument 3 can be used to analyze the existing context for in-service qualification-upgrading courses.

3

ACTIVITY

Instrument 3

In-service Qualification Upgrading Program: A Review

INSTRUMENT 3

The case study in Document 2 explores how ODL complements existing provision. Document 2 is also a useful background to Instrument 3.

2

DOCUMENT

Document 2

Uganda: A Response to Teacher Supply

DOCUMENT 2

(c) *Continuing Professional Development (CPD):*

There is a clear consensus that teachers need career-long professional development. The rationale for CPD is rising expectations about the quality of teaching. The knowledge base of the school curriculum is undergoing rapid change: New technologies and pedagogies encourage more active approaches to teaching and learning. These contrast with the passive, drill-dominated models that characterized the rapid expansion of schooling, particularly primary schooling, in the twentieth century.

Although there is strong rhetorical support for CPD, realization, particularly in developing countries is weak. The institutional base for CPD varies markedly from one country to another: In some, the universities play a role, and in others, not at all. Regional and local training centers exist in some countries although for most teachers, especially those in the primary sector, attendance is infrequent. In fact, many teachers spend their entire careers without access to any CPD.

In some countries the use of centers for training is linked to policy initiatives and priorities. For example, training school leaders is seen as a "bricks and mortar" approach. More often, however, the CPD courses attempt to cover a broad spectrum of needs but seem arbitrary in selecting teacher participants, and the length and duration of courses seem weakly conceptualized.

In some instances local inspectorates play a CPD role, but the remit is often narrow and the staff insufficiently trained.

In many countries, the shortage of resources and skill makes systematic teacher appraisal difficult. More immediate advantages will accrue by enhancing the leadership qualities of school principals. Not all countries, however, allow the school principal to play a leadership role in CPD.

A wide range of open and distance-learning projects support CPD. In Egypt the Educational Enhancement Program **(see Document 4)** provided a CPD program focusing on the teaching of literacy and numeracy for over 100,000 primary teachers. In Kenya an ambitious program of CPD through ODL was initiated in 2005. Around the world a wide range of activity can be identified. In India, the Second District Primary Education Project has an open and distance-learning component that allows all districts to incorporate this approach into their in-service teacher-training programs. Leadership is provided by staff from the Indira Gandhi National Open University. The project highlights the role of women teachers and the education of girls. In the Republic of Yemen, an open and distance-

learning education center is being created to work alongside the national In-service Training Institute. The potential for attracting women (who may not be able or wish to attend a campus-based course) is currently being investigated. The Secondary Education Project in Jamaica has an open and distance-learning component for teachers (Lang 1997). The Palestinian Executive Agency's Ministry of Education is also using open and distance learning as a major component for a project upgrading the 95 percent of underqualified teachers in schools.

International evidence increasingly indicates that instructional expertise should be the focus of any system-wide attempt to improve the standards of school and pupil performance. Much of the evidence base thus far is in Europe and North America, but the discussion is clearly of relevance to all countries.

Document 3 can stimulate discussion of the system-wide implications of initiating programs.

3

DOCUMENT

Document 3

Contemporary Ideas about a Third Age of School-Improvement Practice

DOCUMENT 3

There are many differences among the programs and each must be examined on its own merits. Furthermore, the interaction of these programs within the teacher-education sector must also be considered. A number of points arise from this discussion that may be of relevance to the development of open and distance-learning programs.

(i) A major concern for program developers is the quality of return on the investment. To what extent will programs improve instructional performance and pupil standards? Linkage of programs will require school-focused supervision, which is expensive unless links are made with groups already working with schools. For instance, the regional inspectorate supervised the implementation of the Educational Enhancement Program for Primary Teachers in Egypt **(see Document 4)**.

(ii) Existing providers of in-service programs (regional teachers' centers) may feel threatened by open and distance approaches even though they do not have the capacity to meet the demand for CPD. It is vital, in this regard, that a program develop a sense of local ownership if it is to be sustainable **(see Document 5)**.

(iii) When a clear purpose and need of CPD have been established, open and distance methodologies can meet the needs of large numbers of teachers cost effectively. However, a good program design with adequate local infrastructure is necessary to realize the potential of this approach.

Instrument 4 can prompt discussions on the existing context for CPD programs.

4

ACTIVITY

Instrument 4

Continuing Professional Development (CPD) Programs: A Review

INSTRUMENT 4

Documents 4 and 5 provide accompanying case studies for this task.

4

DOCUMENT

Document 4

The Educational Enhancement Program for Primary Teachers in Egypt

DOCUMENT 4

5

DOCUMENT

Document 5

Albania's Kualida Program for the Continuing Professional Development of Teachers

DOCUMENT 5

2

2. Can Existing Infrastructures Be Re-used for this Program?

Although open and distance-learning techniques do not require the construction of a campus, they do require institutional, administrative, and often, technological infrastructures. These infrastructures are determined by the size and needs of a particular program. While these needs may not be apparent at the scoping phase of a project, a rough survey of existing infrastructure will help assess future costs and feasibility. In the case of an in-service program for primary teachers, for example, it would be advisable to examine resources available in the average primary school. The following questions can help assess existing infrastructure:

- Can teachers receive mail reliably?
- Is there a library or resource center where tutorials can be held?
- Does the average primary school have electricity or phone service?
- How far away, on average, is the nearest university or teacher-training college?
- Are there any teacher centers?

It is increasingly important to look at both current and future infrastructure for communications. Until about twenty years ago, most communications infrastructure was based on telephone lines and broadcast airwaves. While "wired" and "wireless" media are still the two types of signal carriers, the technologies in each of these two groups have become faster and more versatile.

And some open and distance-learning programs for teacher education are beginning to make use of telecommunications connections that go beyond broadcast radio and television. These have, until recently, largely

involved linking computers through telephone lines or fiber optic cables.

Education interventions using radio and television are dependent on the favorable policies in the government sector that regulates broadcasting, even in countries where the communications system has been decentralized. Those that use computers and other digital technologies often, by contrast, rely on different government authorities—usually those responsible for telephones. The technical components of broadcasting and telecommunications are increasingly becoming indistinguishable. Because digital technologies are relatively new, there has been more experience with relationships between educators and broadcast regulators. Unfortunately, these have not always been productive. Ministries of information have been reluctant to share the cost of transmission to educational institutions by sharing production facilities and/or reducing transmission fees. The climate, however, is changing fast.

Many argue that the technologies are not yet in place to achieve a sea change that would make their use for teacher education and practice feasible in the foreseeable future. Kofi Annan, speaking in 1999 to the Millennium Assembly, spoke of the 'yawning digital divide,' with more computers in the USA than in the rest of the world combined and as many telephones in Tokyo as in all of Africa. "Visions of a global-based economy and universal electronic commerce, characterized by the 'death of distance,'" he said, "must be tempered by the reality that half of the world's population has never made a telephone call, much less accessed the Internet" (OECD 1999). A study recently carried out in the Eastern Cape, South Africa, exemplifies this (Leach 2005). Although across South Africa as a whole there are 72.6 computers and 410.5 fixed-line and mobile

Technology	No. used before (%)	No. never used before (%)
Computer	10 (43.5)	14 (58.3)
Mobile Phone	15 (71.4)	6 (28.6)
Television	21 (87.5)	3 (12.5)
Radio	19 (82.6)	4 (17.4)
Internet	6 (27.3)	18 (75.0)

telephones for every 1,000 people and 3.1 million Internet users, most of these resources are concentrated in urban areas. Some rich suburbs, for instance, have 70 phones per 100 people; however, in the remoter parts of the Eastern Cape this statistic falls as low as 0.1 per 1,000 people – the same is true for access to PCs (Accenture 2001). Within a sample of teachers involved in the study, none owned a computer and 14 (58%) had never seen or used a computer prior to the project. The majority (75%) had never used the Internet. Of the ten teachers who had experience with computers, only five had 'occasionally' used them in relation to teaching; four of the five worked in the project's town schools. The other five had 'occasionally' used a computer at an Internet or study center, or with a friend, but never for teaching. Previous applications of the technology were overwhelmingly for 'personal use.'

The 12 schools in the study varied in the range of technologies and other resources they provided, reflecting local demographics. Six had no electricity and five no telephone connectivity. All schools could access a mobile network, however, and at least one teacher in each owned a cell phone.

Information and communications tools are becoming increasingly portable, flexible, and powerful and numerous studies point to the potential of hand-held technologies as learning tools (Soloway et al. 2001). Many studies have investigated the use of hand-held computers in classroom settings, but most focus on student learning (Yarnell et al. 2003). A major systematic evaluation for SRI International (Vahey & Crawford 2002) with over 100 teachers on the educational uses of hand-held technologies in schools in the USA suggests that teachers are highly positive about the use of hand-held computers in the classroom. They are perceived as 'effective instructional tools,' with the potential to have a positive effect on student learning. Key benefits are seen to be increased time using technology, increased motivation, and increased collaboration and communication.

Soloway (2002) argues that hand-helds provide an opportunity for making major changes in educational settings. He dubs this mode of technology the 'Trojan Mouse'. Soloway et al. (2001) and Roschelle and Pea (2002) have all proposed ways in which hand-held wireless Internet learning devices in particular have potential that is vastly different from school computer labs or classrooms.

Extract from: European Journal of Teacher Education, Vol. 27, No. 1, March 2004

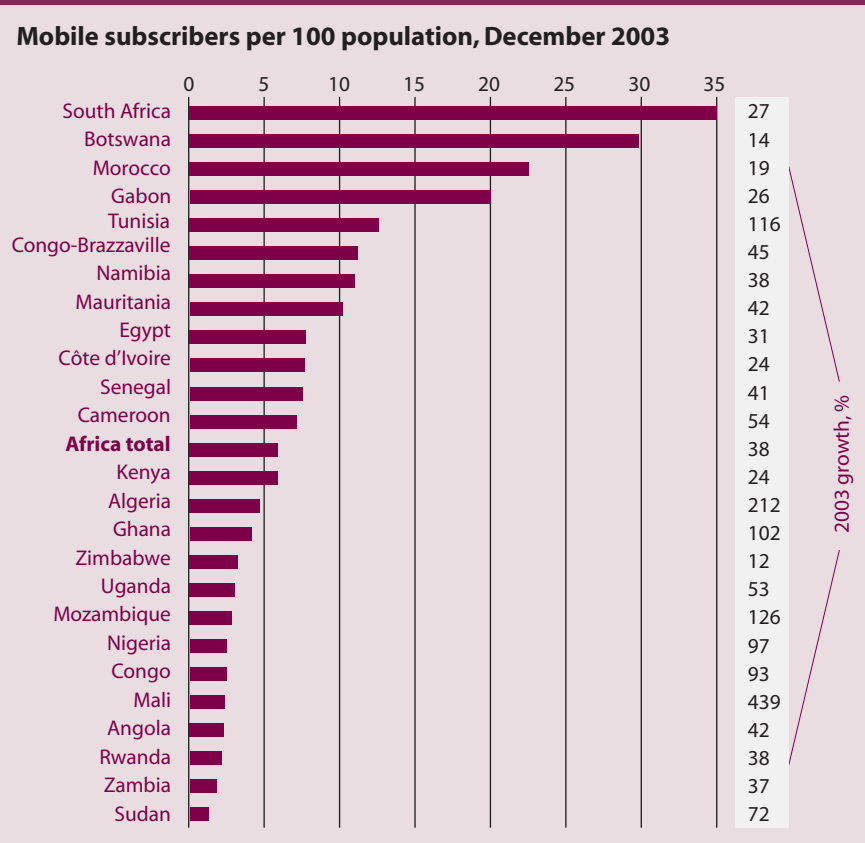
DEEP impact: a study of the use of hand-held computers
Jenny Leach, Rakhee Patel, Alexis Peters, Thomas Power, Atef Ahmed, & Shumi Makalima

[…..]

Despite this evident digital divide, the global technological context is shifting daily. There are already signs of dramatic change in relation to ICT access and infrastructure within Sub-Saharan Africa. 'In 1999 there were 1.5 billion telephone lines worldwide [...] while today there are nearly 2.5 billion. In just four years we have added 1 billion lines to the 1.5 billion we had connected in all the years before—and 75% were installed in the developing world' (Utsumi 2003). This trend is confirmed by World Indicators of ICT (see for example World Bank Data

Figure 5

Mobile Phone Ownership in Africa



Mobile phones in Africa (Minges 2004)

and Statistics: *http://www.worldbank.org/data/countrydata/countrydata.html*); Africa now has twice as many telephones as Tokyo and these are becoming used in more sophisticated ways by the day. Over the last five years mobile phone use in Africa has also increased at an annual rate of 65%, twice the global average. Africa is now by far the world's fastest growing mobile market (Minges 2004) and '*the mobile communications sector has to qualify as one of Africa's success stories*' (Minges ibid. 1). The Economist (2005) recognized such developments in a recent leader article '*The idea that a digital divide separates rich countries from poor, as usually understood, is a myth*' it argued, '*Poor countries don't need a PC in every home. What they need is more mobile phones*' (p.1)

Parallel to this leap forward in respect of access and infrastructure, most governments world wide have now established ICT developments as a national priority, including for educational purposes. A report by Intelecon (2004) based on six country case studies, undertaken on behalf of the Commonwealth of Learning, examined ICT-based learning across selected Commonwealth countries illustrative of the Commonwealth's diversity (Canada, Trinidad & Tobago, Fiji, South Africa, Mozambique, and Ghana). This report reflects a sea change in thinking in all these countries, especially in respect of governmental awareness of the importance of ICTs in national education policy and practice. In South Africa, for example, investment in ICT nationally, including in education, is growing sharply (Fig. 5). In 2001 $11,430,000,000 was invested in ICT (5.7% of GDP); Power (2005) notes this represents a spending on ICT of $268.7 for every person living in the country.

Such trends are evident in most countries in Sub-Saharan Africa. In Rwanda, for example, a plan is in place to install fiber-optic cables countrywide and a visionary national educational policy on ICT is being developed (Rwandan Vision 2020: *www.usaid-rwanda.rw/SO2/VISION%202020.pdf*). From a '*developmental*' perspective, the DEEP experience suggests that policymakers and educators need to start with a broad view of ICT and what it can achieve, rather than simply with technological roll out.

Evidence therefore suggests it is only a matter of time before widespread connectivity will be possible, perhaps commonplace, even in the remotest areas of Sub-Saharan Africa. But long-term policies on ICT and pedagogy take time to develop and implement. A research study of ICT use carried out in twelve communities (Leach et al. 2005) illustrates what it is already possible to achieve in rural schools, even where infrastructure is fragile, and experience of ICT negligible. At project end, only five teachers overall

(out of fifty participants) said that 'technical problems' presented a barrier and only one cited 'poor' or 'no access' as an impediment to their work, despite fragility in many cases of Internet access. This study concluded that those interested in teacher education cannot wait until the last school in the last province has electricity before they begin to evaluate and implement good practice in the use of technology. The potential of new wireless technologies, combined with the expanding potential of flexible, mobile equipment is such that, when connectivity in an area becomes available, educators must already understand how it can be used to enhance and transform teacher education and pupil learning (Jordan 2005).

Policies of the telecommunications sector will, in the future, play a role in equity issues. These are the players who have a strong voice in whether to invest first in satellite and other technologies that serve rural areas or to concentrate on urban networks. These issues affect the shape that open and distance learning can take, and opportunities will continue to differ by country.

Most observers expect wireless technologies to become dominant in the near future, which will substantially improve access to rural communities (Fillip 2000). These issues must be fully explored with policymakers.

What is clear is that no country can begin planning an ODL program without thinking very carefully about the way new technologies are likely to become universal within a very short time, given the convergence between technologies (for example, mobile or cell phone with Internet access).

3 3. How Should the Program Relate to Relevant Interest Groups and Other Providers?

The program's relationship to interest groups should be considered at all phases of development. A list of relevant interest groups and other providers would be context specific; some examples include the following:

- Politicians
- Local administrative officials
- Inspectors
- Conventional teacher-education institutions

- Teacher unions or associations
- School principals
- Teachers and, in a few contexts, older pupils
- Parent organizations

Open and distance-learning programs represent change in the local educational environment. Lack of support from key stakeholders may jeopardize the sustainability of programs. An ambitious educational television experiment in the Cote d'Ivoire just over twenty years ago failed for this and other related reasons.

The project sought to change curriculum content, pedagogy, and the medium of instruction in primary education through a centralized national program. The expectation was that television would serve as a cost-effective tool to reduce disparities between urban and rural education and raise the quality of teaching overall. Although solid evaluation data were never collected, reports show that a higher percent of television students reached grade six than conventional students, repetition rates declined from 30 to 10 percent over the life of the project, and students reached higher levels of achievement in spoken French.

The project suffered from a number of problems and was discontinued. Initially, inadequate consultation with stakeholders led to resistance by teachers' unions and influential parent groups. An overreliance on expatriate technical assistance failed to develop local capacity. Insufficient cost planning and an ambitious timeframe led to cost overruns.

In developing countries, a participatory approach has been found to be successful. Therefore, once a list of potential stakeholders in a program has been compiled, their role in the successful implementation of the program needs to be resolved. Roles and tasks for stakeholders might include the following:

- Material development
- Advocacy
- Accreditation
- Access to telecommunications
- Tutoring or school-based support

The grid in Instrument 5 can be used to help teams compile a list of key stakeholders.

5

ACTIVITY

Instrument 5

Stakeholder Grid

INSTRUMENT 5

Module 3 What Is the Composition of the Budget?

An itemized budget must feature in preliminary discussions. At an initial stage, focus may be on overall funding sources. This is particularly important when thinking about long-term sustainability of a program.

An integral part of the scoping phase is the cost analysis of producing open and distance-learning programs in teacher education. At the early phase of development, this may require a comparative-cost analysis of conventional provision versus the proposed open and distance provision. This is a complex area, where ODL costs may include resource development, local support, assessment, and quality assurance. However, these costs must be balanced against the cost of travel and of replacing teachers.

Without local support, open and distance programs usually cost less than conventional courses. The extent, however, to which they are effective would be questionable. Local support is a crucial element in teacher education. However, this is costly unless existing personnel can be deployed to serve the needs of the new program (for example, the role of school inspectors is modified to assume developmental responsibility of open and distance-learning programs).

Cost analysis in setting up open and distance-learning programs is significantly different than in conventional programs. Even when open and distance-learning programs have been operating for some time, attention to costs has not always been an explicit policy and administrative consideration.

It is important, therefore, to highlight a number of important concepts that must be considered in cost analysis. Four are discussed here:

- What is the total calculation of costs?
- What are the fixed and variable costs?
- What is the opportunity cost?
- What is the unit of cost comparison?

What is the Total Calculation of Costs?

Many planners are unaware of the full costs of mounting a program, particularly where technologies are involved. There are significant costs associated with developing programs, broadcasting programs, training staff to use programs, assisting in maintenance, and ensuring that there is a regular power supply. This last is a critical consideration, particularly in areas where electricity is costly and in many rural areas without electricity.

What are the Fixed and Variable Costs?

The relationship between fixed costs and variable costs is also of crucial importance. ***Fixed costs*** are those costs required to develop and operate a learning system irrespective of the number of learners served. These include the investment costs of developing lessons, broadcasts, and software and administrative costs. ***Variable costs*** are those costs that are directly determined by the number of learners in the system. These comprise facilities, books, and other materials. Most, but not all, capital costs are fixed; however, the number of radios, televisions, and computers depends on the number of learners served. Typically, the proportion of variable to fixed costs is higher for conventional education than for distance education.

The fixed costs of course development, software, broadcasts, and management systems become more economical as they are spread across more users. This is where distance-education systems may have a cost advantage over traditional systems. As can be seen in **Figure 6**, total costs increase more slowly in distance-education systems than in conventional systems. As a consequence, when the system has more than a particular number of students (s* below), the total cost of the distance-education system is less than the total cost of the conventional system. The ***average cost*** for conventional instruction can be high because of salaries, policies that limit teacher-to-student ratios, and costs of building and maintaining facilities. The average cost of distance-education programs can be lower (discussed below) when the fixed costs are spread over large numbers

of institutions as there is less direct face-to-face teaching time, and most learning does not take place within regular school facilities. This is shown in Figure 6 below.

In conventional instruction, the average cost for each student and the marginal cost (the cost of adding an additional student to the system) are often about the same. In ODL, which replaces skilled labor with technology, the marginal cost of adding an additional student is always lower than the average cost. To take advantage of economies of scale, the number of students should reach the point at which the marginal cost of adding another student reduces the average cost. In determining whether an ODL program is viable, it is necessary to look at three areas:

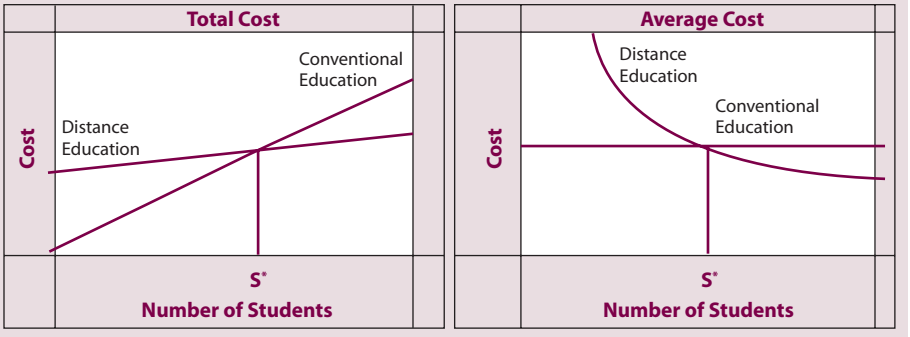
- Can it be implemented?
- Can it go to scale?
- Is it sustainable?

What is the Opportunity Cost?

In a cost-effectiveness comparison between distance education and conventional provision, ***opportunity cost*** must also be considered. From the student's perspective, enrollment in a distance-education program is likely to save not only the cost of room and board but also the opportunity costs of unemployment. The teachers do not have to leave the classroom

Figure 6

Fixed and Variable Costs of Open and Distance Learning



Source: Murphy, Paud, S. Anzalone, A. Bosch, and J. Moulton. 2002. *Enhancing Learning Opportunities in Africa: Distance Education and Information and Communication Technologies for Learning*. Washington, D.C.: the World Bank.

to advance professionally and learn new skills. Further, the continuity this affords the classroom has significant implications in the educational system.

What is the Unit of Cost Comparison?

In studies of cost effectiveness, the ***unit of cost comparison*** must also be kept in mind. While the most common unit of comparison is the cost per student, this unit can be misleading because graduation rates tend to be lower at distance-learning institutions than at residential colleges or conventional schools (Jurich 2000). Enrollment does not guarantee that a student will gain from the experience. More meaningful units for comparison may be the ***cost per module*** of learning or the ***cost per graduate***. However, it is also important to remember that some students choose distance learning simply to further their education and not necessarily to graduate. The cost-per-graduate measure does not account for those studies. Thus, cost per module of learning may offer a better comparison, particularly for CPD programs that are not accredited by a higher education institution.

The unit of comparison is more difficult to define when technologies are used to improve quality. In these circumstances, the key unit of comparison may be the cost of an additional unit. Decisions about adding computers or introducing radio instruction should be made on the basis of the additional cost and the effectiveness. If it costs ten times as much to introduce television as it does to introduce radio instruction, but the learning benefits are more than ten times as great, then it may make sense to introduce television. Where the differences in learning gains are not so marked, the better decision may be to introduce radio instruction. Similarly, in a program that has local support, the issue of the more costly provision of occasional residentials would need to be examined.

For many seeking teacher education, the option of conventional face-to-face programs is limited or impossible. College and university programs are working to capacity and the logistics deter teachers, especially in remote rural locations, from attending. Thus, at a national or regional level a comparative-cost analysis makes a strong argument in favor of ODL.

Once the need for an open and distance-learning program is established, preliminary consideration must be given to budget itemization. This allows policymakers to identify information that must be collected and decisions that must be taken in the early start-up and implementation phases of the program.

Use Document 6 to stimulate a dialogue on costs.

6

DOCUMENT

Document 6

Comparative Costs of Open and Distance Learning and Conventional Teacher-Education Programs

DOCUMENT 6

Instrument 6 is in the form of a sample Excel spreadsheet that could be developed for this purpose.

6

ACTIVITY

Instrument 6

Sample Cost-Analysis Spreadsheet

INSTRUMENT 6

Conclusion to Scoping a Program

This first phase of development of a program has sought to identify the key issues that need consideration. A sound foundation of data and preliminary decision-making is essential to succeeding in subsequent phases. Some of the issues identified may be eliminated by the purpose and focus of the program being designed. Experience suggests, however, that such a process is as important as the data collection and decision-making around the issues that relate directly to a program. Instrument 7 allows a review to be made of each of the key questions addressed in the scoping phase of program design.

Instrument 7 sets out eight key questions that have been addressed in the scoping phase of the program.

7

ACTIVITY

Instrument 7

Scoping a Program: Key Questions

INSTRUMENT 7

Contents

Overview of Modules 4–5

These modules analyze questions that generate important discussions during the initial phase of program start up. The key audience is planners, particularly program managers, who might involve a range of educators with detailed knowledge of the program context.

These modules should enable managers to discuss the key technical decisions to design, develop, and produce an effective course of study and to discuss strategic program decisions to implement an effective program.

If the scoping phase is thorough and successful, the start-up phase of a program will be able to follow quite logically. To begin creating a program, it is necessary to review the scoping phase, particularly questions about purpose, stakeholders, existing provision, and budget. A review of these questions should set the foundation for the program. This initial stage will also involve continued advocacy for the new program and sensitivity to existing local provision.

The following factors are important to keep in mind:

- Expectations of a new program must at least match, if not exceed, current provision.
- Necessity of the new open and distance-learning program may have to be demonstrated by an explicit analysis of the capacity and costs of existing provision.
- Cost effectiveness of the new program might also need to be assessed against that of conventional provision (where it exists).
- Design of the new program should use aspects of existing provision where appropriate.

Designing a program framework for teacher education requires experts with knowledge of open and distance methodologies as well as contemporary ideas about teacher education. Much of the program design at this stage will be provisional and should ideally be examined by program managers. If program managers are not yet selected, the process may have to be developed with ministry or regional officials with a limited knowledge of ODL. A consultant may be used to provide input at this point.

Module 4 What Information from the Scoping Phase Needs Elaboration?

1. What Are the Basic Parameters of the Program?

As discussed in Module 1, the purpose of a program forms the core of its design. The type of program provides the first parameters for planning. The focus and proposed content will further define these parameters. Such parameters are well illustrated by a series of case studies carried out for the United Nations Educational, Scientific, and Cultural Organization (UNESCO), categorized as programs for initial teacher education, CPD, reorientation of teachers for curriculum reform, and career development (see **Figure 7** for examples).

Figure 7. UNESCO ODL Program, Teacher-Education Studies

Initial qualifications

Nigeria: *The National Teachers' Institute*. The National Certificate in Education (NCE) is a print-based distance program offered by the National Teachers Institute in Nigeria, a unique distance-teaching teacher's college. It provides an alternative but equivalent route to minimum national initial teaching qualifications for working primary teachers in a country very short of qualified teachers and where conventional college output cannot meet demand. It aims to provide large-scale training in a high-population country at affordable costs.

United Kingdom: *Open University*. The Open University's PGCE program uses ICT and distance education to support the school-based training of graduates in the United Kingdom. It reflects UK government policy to increase the role of school experience and the use of competency-based approaches in the initial preparation of teachers

China: *The China Television Teachers College*. The China Television Teachers College (CTVTC), a part of the China Central Radio and Television University (CCRTVU) since 1994, provides large-scale teacher education through a national distance teaching institution. Distance education is included in China's strategic planning for teacher education and plays a significant role in initial teacher education and continuing professional development. Its aim is to provide large-scale teacher training at an affordable cost and to provide a unified system of teacher training.

Continuing professional development

Brazil: *TV-FUTURA*. A-Plus is a daily informal television series designed to stimulate interest in education, teaching, and learning among teachers and other educators in the broader community. Taking a journalistic approach, it uses a private educational television channel to reach an audience of 13 million across Brazil. It also helps mobilize teachers into follow-up action through its Community Mobilization Networks. These extension activities aim to help teachers extend teaching practices in ways that include community involvement, participation, and development.

India: *Indira Gandhi National Open University*. The Certificate in Child Guidance is a print-based distance program for primary teachers, parents, and social workers, provided by the Indira Gandhi National Open University (IGNOU) in India. Using printed text, audio, and video materials it provides a practically oriented, non-specialist program which is not otherwise available. The numbers of students have been relatively small (less than a thousand per year).

Egypt: *Cairo University and Ministry of Education*. Egypt has set up a national network of 39 distance-training centers in all governorates and, by using interactive TV technology, has provided scheduled short in-service courses training for teachers and also for educational inspectors, directors, and leaders. Trainees in the centers are able to watch subject-specialist presenters in real-time and have the opportunity of putting questions to them via center coordinators.

South Africa: *University of South Africa (UNISA)*. The BPrimEd and BSecEd are print-based degree programs in teacher education provided by the University of South Africa (UNISA), one of the world's largest distance-teaching universities. Distance education plays a prominent role in teacher education in South Africa – more than a third of its primary and secondary teachers were involved in distance education in 1995. These programs began as in-service ones for working teachers wanting to upgrade to degree level but later diversified to include a pre-service target group too, in response to government policy change.

(*continued*)

Figure 7. UNESCO ODL Program, Teacher-Education Studies

Re-orientation of teachers for curriculum reform and change

South Africa: *Open Learning Systems Educational Trust (OLSET)*. English in Action is a South African interactive radio program, run by an NGO, with two audiences: primary school children and their teachers. Through a well-structured curriculum and active learning approaches, the children learn English while the teachers improve both their English and their teaching of it. This informal programm asks teachers, many of whom have low levels of English or poor teaching methods, to lead language development activities, such as games or pairwork and to mediate content, if necessary in the mother tongue.

Mongolia: *UNICEF and the Ministry of Science, Education, and Culture*. An in-service program for primary teachers in a transitional country with reduced resources for education and to support changes in curriculum content and teaching methods. Though new to the country, distance education was chosen as an affordable means of reaching more teachers more quickly more often than traditional provision, to re-orient them to new teaching approaches and curricula.

Chile: *Universidad de La Frontera*. This in-service prograe aims to teach teachers to learn to use information and communications technology (ICT) in their teaching. It uses ICT to teach teachers to use ICT. Distance education, though fairly new to Chile, was chosen in order to extend the geographical reach of the program, otherwise available in a conventional face-to-face form, and to meet the teachers' needs for new skills and knowledge created by the recent widespread provision of computers to schools.

Career development

Burkina Faso: *Ministry of Basic Education and Literacy and RESAFAD (the African Network for Education at a Distance)*. This was part of a multinational program for West African francophone countries aimed at increasing the management capacity of headteachers. The program benefited from the use of new information and communication technologies to help the process of course development but used print, coupled with meetings of headteachers, to reach its scattered audience. The program reached about a quarter of Burkina Faso's headteachers and there is some evidence from reports of school inspectors of more efficient school management as a consequence of the course.

Source: Perraton et al. (2002a): 21–22.

As already pointed out, such categories inevitably overlap: career development may well be regarded as part of CPD; some of the programs have more than one audience and may include qualified and unqualified teachers, and so forth.

The estimated number of participants in a program also determines the restrictions that might apply or the opportunities that might be available to the program.

2 2. Who Is the Target Audience?

One of the first issues that should be examined is the nature of the program's participants. This question is fundamental to successful program design in any context, but especially in open and distance learning. Which target audiences are most promising? Are there any for whom distance education would not be appropriate? One of the greatest challenges in ODL is retaining participants; the use of effective incentives and limitations is key. Therefore, the more that is known about the typical participants, the easier it will be to address their needs and create a successful program.

Use the chart in Instrument 8 to think about the typical teacher or trainee who may be targeted in an open and distance-learning program.

8

ACTIVITY

Instrument 8

Learner Profile

INSTRUMENT 8

3

3. What Is the Likely Duration of the Program?

The length of the program must be established and will vary according to its purpose. The length of a program should be critically assessed; for example, the length of a CPD program should be balanced against the time needed for the program to make an impact and the imperative to reach as many teachers as possible.

The Kualida Program in Albania **(see Document 5)** initially developed school-based programs to upgrade the pedagogic and subject knowledge of teachers of English, French, geography, and history. In this context the three-month period chosen involved part-time study, school-based activities, and attendance at a tutorial once a month.

KEY MESSAGES

For in-service qualification upgrading and CPD programs, it may be possible to assume that some course time will take place in the classroom during the school day. For example, when teachers are experimenting with new teaching strategies, they will combine course study with their daily duties. The length of an in-service qualification upgrading program can vary according to individual teachers' needs. Teachers with many years' experience, for example, may receive Accreditation of Prior Learning and forego the preliminary classroom-observation experience that new teachers should undergo.

4

4. How Long Will It Take to Set Up the Program?

To establish the infrastructure, develop the materials, and recruit the first students, a program that upgrades the qualifications of perhaps thousands of primary teachers may take as long as two to three years.

An undergraduate module (involving approximately 600 hours of study time) at the United Kingdom's Open University required about two and a half years to develop. This long lead in time can be reduced through careful planning. In the same institution, a postgraduate part-time program leading to qualified teacher status required a year and a half to develop. On the other hand, an Educational Enhancement Program for Primary Teachers in Egypt was developed in a year. **Document 4** includes a copy of the original implementation schedule for the Egyptian Educational Enhancement Program from 1997 to 2000. The schedule forecast a shorter set-up time than was actually required and was subsequently modified. It indicates the sort of planning that can be undertaken. In Ghana the University of Education, Winneba took under three years from a first scoping stage to admitting teachers to a Bachelor of Education (B.Ed.) upgrading program. Some national contexts require rapid implementation. For example, in 2000 the Sengalese government launched its ambitious 'Ten-Year Program for Education and Training' and in 2001 the Ecole Normale Supérieure had responded by launching an upgrading program for secondary teachers.

Most programs will need at least a year from scoping to launch. The Albanian Kualida Program, comprising short courses (three months' duration), required only six months to develop. This program was particularly intensive and considerable effort had to be made to revise and improve the resources and the training materials for local support personnel. In teacher programs that continue over a number of years, all materials do not have to be completed at the outset. It is common for materials to be scheduled in phases that parallel each part of the course.

The size of a project team also depends on the nature of the program. Most ODL programs require a core team of four or five persons to oversee the development of the program and the creation of new systems and infrastructure. Other staff members may be required to write for the program.

Many attempts have been made to estimate the time needed to produce materials. Yet so much depends on contextual factors that definitive measures are difficult to establish. To produce a conventional study text of 50 pages with a minimum of diagrams and illustrations (and no editorial support) can take from four to eight weeks. Producing multimedia materials will take substantially longer, particularly if writers and design staff are inexperienced. Experience also suggests that development teams take longer to produce course materials than originally envisaged and

use more resources than planned. Experienced consultancy support can mitigate this tendency. It is also useful to remember that small amounts of text can generate lengthy periods of classroom-related activity within school-based teacher-education programs.

The Teacher Education in Sub-Saharan Africa (TESSA) project (http://www.tessaprogramme.org/index.shtml) is led by a consortium of African and international organizations and institutions that are providing open content online and text resources that can be versioned into local and national contexts. The resources are linked to a website providing detailed guidance to program designers and implementers.

Module 5 What Elements Should Be Included in a Preliminary Design?

Once the purpose of the program and the nature of the audience have been established, some provisional ideas about program design and consequent costs can be established. Four elements provide a framework for the initial design process and should be considered at this stage: materials, support, assessment, and quality assurance **(see Instrument 6)**.

1. Materials

What Are the Types and Functions of the Resources to Be Developed?

The sort of materials that can be developed, including the extent to which multimedia resources can be used, will vary by context. Successful programs have operated with a limited range of resources. Equally, the provision of television, video, or web-based developments can significantly enrich a program: ICT enables unique interactivity and outcomes such as countrywide teacher networks. Attrition rates for teachers in ODL programs are relatively greater so their materials must be especially stimulating.

There are several types of ODL materials. Most programs offer complementary courses to encourage diverse learning approaches. The choice of materials is usually governed by the educational experience of the learner and the availability of other resources. For example, an assignment that requires the learner to use reference material would be inappropriate without library access.

Figure 8 gives an example of the wide range of technologies used in the different UNESCO case studies, referred to in Figure 7 (Perraton et al. 2002).

Figure 8. Technologies Used by UNESCO Case Studies

CATEGORY	CASES	TECHNOLOGIES
Initial qualifications Programmes leading to qualified teacher status.	An alternative route to primary teacher qualifications, Nigeria Using ICT to support school-based initial teacher education, United Kingdom Reaching teachers through television, China	Print with face-to-face meetings. Print, computer communications, face-to-face meetings, video and audio, written feedback on assignments. Television and video copies, some print, audio-cassettes, face-to-face classes or meetings.
Continuing Professional development Programmes and activities extending teachers' knowledge, skills and expertise throughout a teacher's working life.	Television-plus: journalism in the service of teacher development, Brazil New routes to teacher education degrees, South Africa. Developing primary teachers' knowledge and skills in child guidance, India	Television and video copies, magazines, newsletters, telephone 'call-in' centre, face-to-face meetings. Print with some face-to-face meetings, audio- and video-cassettes and some small optional element of computer communications. Print, face-to-face meetings and some audio- and video-cassettes.
Re-orientation of teachers for curriculum reform and change Supporting teachers in changing what they teach and how they teach it.	Interactive radio for supporting teachers of English a second language, South Africa. Re-orienting primary teachers to new teaching approaches, Mongolia. Teachers learning to use information technology, Chile.	Radio programmes, audio-cassette copies, print and some face-to-face meetings. Print and audio (radio and audio-cassettes), some videos and face-to-face meetings. Computer communications for an online programme, for delivering materials, supporting interaction, providing access to databases and submitting coursework.
Teachers' career development Programmes to extend the careers of qualified teachers.	Professional development of headteachers in Burkina Faso.	Print and face-to-face meetings.

KEY MESSAGES

Most pre-service and in-service programs are organized into a series of self-study courses, modules, or a combination of these, requiring individuals to complete the series in order to qualify. As in traditional institutions, participants will start and finish together and complete assignments or take examinations simultaneously. CPD courses may follow this format or may be more individually focused, with participants studying and completing assignments at their own convenience or on a range of given dates. As stressed earlier, the primary goal must be to provide a high level of interactivity between the learner and the content of the course. High-quality materials will retain learners' interest.

2 2. Project Support

What Are the Nature and Role of a Preliminary Staff Structure?

A common difficulty with ODL programs is an overly ambitious plan to develop self-study texts. In some instances teams of local teachers and advisers with little or no experience of writing such texts are given tasks that even the most experienced developers would find daunting. Provisional estimates of the material to be developed, particularly text material, should be carefully considered. For example, the provision of face-to-face tutorial support can reduce the use of resources.

Material development and support are related. Where school development and the quality of classroom practice are prioritized, school-level support is necessary. For example, if local tutorial support is integrated, assessment and quality assurance are less complicated than for programs without local support. As indicated above, it is difficult to identify where unsupported programs can best be used (in some countries the advanced training of experienced and well-qualified principals is being achieved by singularly open and distance approaches, but these usually make extensive use of web-based support and interactive electronic conferencing systems).

The core staff must be hired and begin work at the outset of the initial development phase. Depending on the size of the program, the staff will usually consist of a program director, several support staff with expertise in distinct areas, and possibly some consultants.

(a) *What Criteria Should Be Used in Appointing a Program Director?*

Four key criteria are specified in the initial search:

- Knowledge of the local educational context
- Teaching and teacher-education experience
- Familiarity, preferably through experience, of open and distance teaching and learning
- Confidence in using new ICTs

Personal leadership qualities are also determinants. Program directors without specific ODL experience are frequently appointed. Sometimes good leadership qualities may outweigh technical expertise if consultants or training support is available. Directors without ODL experience led the

Albanian Kualida Program and the Egyptian Educational Enhancement Program. They were supported in the initial stages by consultants.

The program director becomes the advocate for an open and distance-learning approach; thus, his or her standing with related institutions and interest groups and communication skills are also important.

By the time the project director is established, the institutional base is also selected. If an institution (ministry or educational district office) already exists, accountability structures need to be formulated. The degree of autonomy afforded to a program is largely determined by contextual factors.

(b) *How Should a Program Team Be Set Up?*

Program directors need technical support. In teacher-education programs this commonly takes the following forms:

- An overall administrator responsible for developing systems, maintaining databases, and monitoring and disbursing financial resources
- A coordinator for the production of resources, providing the liaison between resource authors and editorial, graphic, or multimedia staff who are involved in the output of materials
- A leader in local support structures, identifying study centers, appointing local tutors, and creating administrative systems to supervise these elements of the program
- A secretary or other clerical support

A common problem in establishing programs is underestimating the importance of infrastructure building. In face-to-face institutions, word of mouth and informal contacts serve an important function in the smooth operation of systems and infrastructures. For programs that employ 500 to 1,000 teachers who are geographically dispersed, such arrangements become impossible. In ODL programs a stronger systems base needs to be in place. Understanding scale, logistics, and infrastructure is a key element of project management, and the structure of the core team needs to reflect this dimension of the task. The functions of open and distance-learning programs are not identical to those of conventional educational programs. Management functions of distance-education programs will

vary according to the organizational structures. For example, program managers operating within a single-mode institution will embrace management functions such as governance—a task that is not typically faced by program managers of distance education working in a dual-mode institution.

KEY MESSAGES

Distance education and educational technology programs require specialized skills that are often found outside the existing educational system. Such learning systems require the development and operation of a variety of specialized subsystems: course development, evaluation, tutoring, student support, broadcasting, materials production, distribution, operation of remote sites or of local and regional study centers, and so on. Managers in distance-education programs face quality-control issues in ways that are fundamental to the survival of their institutions. Similarly, the management of distance-education programs may be related to the costs of creating courses, selecting technology for course delivery, and determining "break even" points for course enrollments. These involve functional skills seldom required of administrators of conventional education programs.

One reason the challenges of program management in distance education are poorly understood is that the teaching and learning processes for open and distance learning is not clearly differentiated from conventional education. Consequently, course materials, lecture notes, and educational broadcasts produced for conventional programs are recycled for distance learning even though they may be ill-suited. Similarly, there may be a failure to prepare teacher trainers to operate specifically within a distance-learning system rather than in the more conventional instructional role.

Ideally a program team would consist of expertise in the focus area and experience in writing and in ODL methodologies. However, it is difficult to find individuals with this range of skills. The team approach allows the different knowledge and skills to be represented collectively rather than individually.

Document 7 outlines the key tasks for a program director and the areas of expertise needed by a program team.

7

DOCUMENT

Document 7

An Overview of the Management and Administration of Teacher-Education Programs Using Open and Distance Learning

DOCUMENT 7

(c) *What Type of Training Is Necessary for Staff Working on the Program?*

Training support will be required if development teams lack the requisite experience (such as material development, support, assessment, and quality assurance). At an early stage, however, an audit of staff needs in relation to the content and methodology of the program must be established. Staff with distance-education experience may not be fully aware of teacher-education issues. Staff with teacher-education experience are unlikely to be aware of the logistics or development models associated with distance education. Training sessions, particularly residential ones that extend over a week or more, can also be used as staff-development sessions. The choice of a training leader or training organization is, therefore, important.

3

3. Assessment

What Forms of Assessment Are Envisaged?

In many countries formal examinations assess the individual student or teacher and ensure quality. Not only is this expensive, it is also less effective when the focus of the training is on improved classroom practice. Planning during the initial development phase should allow course design and cost decisions to be connected. It may be more effective to have local tutors monitor teacher development through indicators of classroom performance than through formal examinations. In some systems the role of the principal or other senior staff is sufficiently well-developed to monitor teachers **(see Document 9a)**.

4

4. Quality Assurance

What Processes for Ensuring Quality Are Being Put in Place?

In addition to assessing the course participants, the course itself must be assessed to ensure it is effective and is achieving its objectives. Once the components of a course (for example, materials, syllabus, and preliminary schedule) have been assembled into a whole, and a draft study guide is available, a design evaluation can begin. Evaluators need to have a clear understanding of the types of students the course is targeting and concise criteria by which the course should be judged.

Design evaluation entails assessing a course during its development, often in its pilot stage, before it is offered on a large scale. The purpose of this type of evaluation is to ensure, as far as possible, that a course works in the way it was designed.

Such early evaluation is critical. It can determine the success or failure of materials or the need for support during the development stage. An insightful design evaluation can provide critical feedback to inform the creation and design not only of one specific course but of others as well. Evaluation is time-consuming and costly but, as experience at the Open University and other institutions has shown, is well worth it.

Design evaluation involves verification of all aspects of a course, from logistics to content. Staff and consultants usually do an internal evaluation, which can also be an opportunity to solicit input from external experts and gain fresh perspectives.

Criteria for these evaluations often emerge from the basic challenges of open and distance learning, namely attrition, quality, and cost. Criteria generally reflect these challenges and can be determined more specifically by course developers and evaluators. Additional categories and criteria may emerge over the course of the evaluation.

Design evaluation can include the following methods:

- A ***review*** of the course prototype by internal and external experts (for example, content experts, distance-education experts, and course-design experts).
- A ***pilot study*** conducted with a small group of participants, with special attention to areas of difficulty. Feedback is gathered in written form or through focus groups.

- A written ***survey*** that poses specific questions about the course prototype. Evaluators may be told to rate the effectiveness of particular materials of a course.
- An ***evaluation feedback*** from teachers in the development stage who test materials or pilot aspects of the program.

Instrument 9 can be used to determine course-evaluation criteria.

9

ACTIVITY

Instrument 9

Design Evaluation

INSTRUMENT 9

5

5. What Elements Should Be Included in a Preliminary Costing Plan?

In addition to development staffing, discussed above, major elements of a preliminary budget should include material development and other development costs such as copyright clearance and technology costs.

Although it is difficult at an early stage to accurately predict costs for the program in its full implementation phase, general estimates for the following categories should be kept in mind:

- Staffing for the course
- Stock
- Tuition support (including school-based support)
- Other presentation costs (for example, network maintenance)

Cost-Analysis Spreadsheet

Revisit **Instrument 6** (Cost-Analysis Spreadsheet). Reworking through a spreadsheet will identify key decisions that must be taken, for instance, the nature of the resources to be developed and the forms of support needed.

Even at the scoping phase, participants must have the technical expertise and the local knowledge to make general decisions on some of the issues.

In many contexts, determining costs may prove difficult if prior decisions have been made about the involvement of a particular staff group. Those scoping a program clearly need a mandate to make decisions. For example, in one project it was decided that the section of the ministry responsible for textbooks would write the materials. The ministry's internal accounting system made it extremely difficult for program leaders to assess costs. Program leaders should have been given salary costs so they could have estimated operating costs.

New, interactive technologies pose an additional challenge for program budgeting because their efficacy depends on a range of variables that are untested in this context. To what extent, for example, can expensive in-school, face-to-face support be replaced by asynchronous electronic conferencing or other forms of communication technologies? **(See Documents 9b and 13.)** While new technologies do appear on the budget, the principles of the costing model remain the same. Programs that include some form of school-focused support, for example, will clearly be more effective than those without.

Some administrations may eschew transparency in cost areas on the grounds that this can work to the advantage of the programs. For example, where staff have multiple roles, costs might not be explicitly allocated to a distance-education program. Experience suggests, however, that a sound understanding of full costs is likely to give a stronger foundation for programs.

The following must also be considered in determining a preliminary costing plan:

- What is the best mix of materials and support that the program can afford?
- What incentives and limitations exist in current programs?

Conclusion to Initial Development Phase

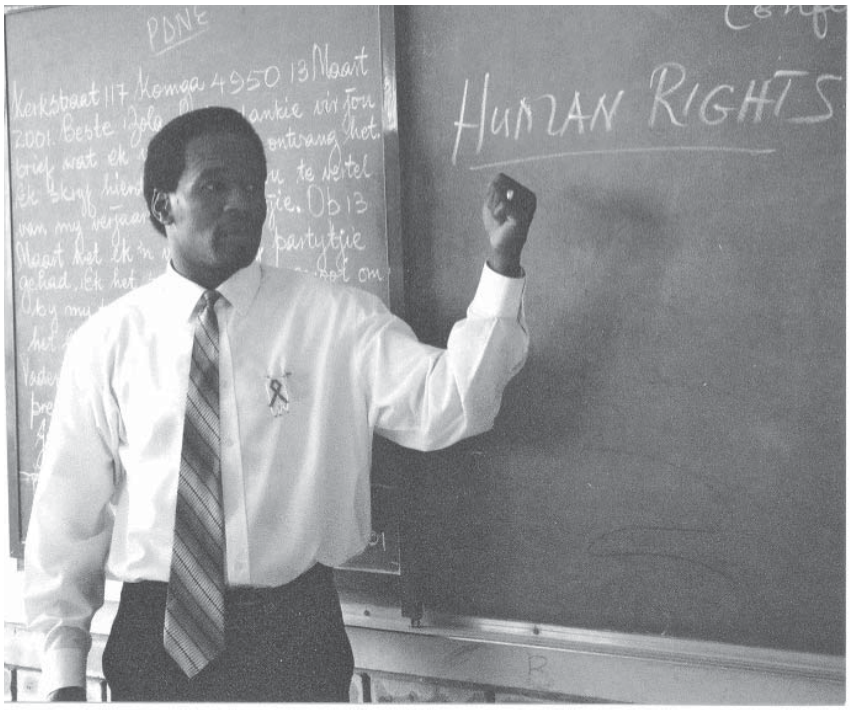
By completing the activities for the **initial development phase**, key program and technical decisions can be determined.

Key program decisions include:

- Parameters of the program
- Target audience
- Program duration

Key technical decisions include:

- Type and function of materials
- Project support
- Assessment
- Quality assurance
- Costs



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Overview of Modules 6–9

Overview of Modules 6–9

The prime audience for these modules is the program director and the team that has been assembled around such an appointment. Each of the questions addressed in earlier phases of planning now has to be considered in greater detail. In doing that it may be necessary to revisit some aspects of the scoping and initial development phase decisions. The modules specify questions that need answering and provide relevant information that needs reviewing prior to the decision-making process. These modules emphasise the four key components that make up any open and distance-learning program, namely materials and how these materials reach students, support systems, assessment and quality assurance. Each is reviewed in turn. It is important, however, to stress the holistic nature of this process. ODL programs that fail often demonstrate insufficient interrelation among these elements. For example, a program with a large amount of student support might not need to develop as large a range of self-study resources as a program with lower levels of support. The design of the assessment system needs to reflect the nature of the materials and associated activities. One common mistake in the design stage of program development is to give attention to material development at the expense of well-thought-through strategies for support, assessment, and quality assurance.

Module 6 What Are the Options for Curriculum-Organization Models?

Clarity about the nature and focus of curriculum content is key. A UNESCO report (Perraton et al. 2002) sets out four main elements of teacher education: improving the general educational background of learners; increasing the knowledge and understanding of the subjects; understanding pedagogy of children's learning; and developing practical skills and competence.

1 1. How Can Curriculum Focus Be Clarified?

Program managers need to be clear from the outset about the balance and relationships among these different elements. For example, if the primary concern is to extend teachers' knowledge in a particular subject, then the course should focus largely on that element. Indeed, if one aspect of teacher knowledge is singled out, with a major focus on change in knowledge, understanding, or even the practical skills of the teacher, that program will, by definition, be highly ***teacher centered***. There are difficulties, however, with programs that do not contain any aspect of school-based activity. If the key purpose of teacher education is change in the interaction of teachers and pupils in the classroom, then the development of teacher knowledge is likely to be more ***learner centered*** (Moon and Leach 1999). From this perspective, understanding the thinking processes of learners and the nature of pupil-teacher interactions and investigating daily classroom practice becomes central to defining the focus of the program.

The majority of open and distance-learning programs for teachers are aimed at unqualified and underqualified teachers already working in schools. They have, therefore, an abundance of practical experience. It is essential that this is drawn on in course design. Assignments and activities need to exploit the teachers' access to the classroom. Such assignments and activities need to strongly focus on improved classroom competence and effectiveness. The same principles arise in pre-service training where the trainee has to complete specified periods of school experience. This practice component of any course needs careful planning and the role of support structures is very critical.

Figure 9 compares the characteristics of traditional teacher-centered program design and learner-centered program design in relation to three inputs of the course-design process: context, strategies, and knowledge. It

Figure 9 Characteristics of Traditional versus Learner-Centered Program Design *(adapted from Stein et al. 1990)*

Inputs to the Design Process	Traditional Teacher Development	Learner-Centered Teacher Development
Context	Does not integrate context into programs Takes place away from schools, classrooms, and students	Context plays an important role in development of program Takes place in a variety of locations; at least some occur in schools and classrooms
Strategies	Focus is on activities (techniques, ideas, and materials) Dominant format is course materials, assignments, and tutorials	Focus is on building capacity to understand subject matter and guide students' development of concepts Uses a variety of approaches, including the provision of school-based support of teacher participation in a variety of practice-related activities
Knowledge	Teacher educators and academics set the agenda Theories of teacher learning are based on the psychology of the individual Transmission of new knowledge to classrooms is a problem to be solved (usually by the teacher) Challenge is to scaffold learning that is both immediately relevant to practice and builds a more generalized knowledge base	Experienced teachers develop the program Theories of learning include social, situational, and organizational factors Challenge is to scaffold learning that is both immediately relevant to practice and builds a more generalized knowledge base

highlights key factors for programs focusing on change at the school and classroom levels; for example, the importance of context, the opportunity for school-based experience, the involvement of experienced teachers in course design and preparation, and the focus on learning processes.

KEY MESSAGES

Many contemporary teacher-education programs that seek to have an impact at school and classroom levels do not separate the elements of teacher knowledge. Rather, they link these elements, incorporating a curriculum of ***school-based activities***. It is in the context of preparing and evaluating classroom-focused practice that teachers in these programs are introduced to other aspects of professional knowledge. Using a learner-centered approach to program design makes it possible to ensure that all course texts (study guides, assignments, and resources) directly relate to school practice. **Document 8** could be used as a basis for discussion and debate around this issue.

8

DOCUMENT

Document 8

Teacher Knowledge and the Design of Open and Distance-Learning Courses and Programs

DOCUMENT 8

How are courses and programs best structured?

Programs are normally organized in sections or modules (see Saint 2000). Pre-service, initial training, and upgrading courses may have a more complex format than the more focused CPD programs. In Egypt, for example, the CPD courses were tightly targeted: a single study guide took teachers systematically through a range of CPD activities over a six-month period **(see Document 4)**.

The Fort Hare University, Eastern Province, South Africa, B.Prim.Ed. Program is an example that closely links the elements of teachers' subject, school, and pedagogic knowledge with practical application. The program uses the same modular structure each year although, of course, the context changes **(see Figure 10 below)**.

Figure 10

Annual 8-Module Structure of Fort Hare B.Prim.Ed. Program

January

December

Core Education Studies:

- Learning about learning
- Helping learners learn
- Schools as learning communities
- Learning in the world

Learning areas:

- Literacy
- Numeracy and Mathematics
- Natural Science
- Technology

Document 9 describes the Fort Hare, B.Prim.Ed. Program curriculum and its organization.

9

DOCUMENT

Document 9

Description of Fort Hare University, B.Prim.Ed. Program

DOCUMENT 9

In the United Kingdom, the Open University's Postgraduate Certificate in Education (PGCE) was offered through the 1990s as an 18-month-long program. **Figure 11** shows how this particular course was organized during this period.

In both the Open University and the Fort Hare contexts, teachers admitted to the program were expected to complete the course. Although allowances were made for teachers who needed to withdraw temporarily, a commitment was required at the outset to complete the course. An important decision for program managers in this context was how much flexibility to allow in a course. A course may appear attractive if it allows teachers to study as and when they have the time and opportunity. There are, however, two problems with such flexibility. First, costs can rise if teachers must be registered and formally assessed module by module. Secondly, experience has shown that completion rates can fall when teachers have multiple opportunities to opt out of part-time study.

A frequent problem in course design occurs when designers try to replicate a conventional face-to-face college or university curriculum in an ODL mode. College—and university-based teacher-education courses are often built around credits or modules. A student may simultaneously be following a number of credits, each taught by a different tutor. If that is replicated in an ODL format with different courses and tutors, the logistics become highly problematic. For a teacher in a school, relating to a range of different tutors at a distance is logistically very difficult. For those designing related systems of assessment—posting and tracking assignments and monitoring tutor assessment for quality-assurance purposes—the task becomes organizationally complex.

Some successful programs have clustered credits in a more unified way with the local tutor providing support for the entirety of the course. Local support can be organized on an individual or group level and can range from a phone call to the services of a local tutor to a period in residence at a traditional teacher-education institution. Local support is discussed in more detail below.

Figure 11

Organization of the Open University, Postgraduate Certificate in Education Program

			Study time	School placements*	
STAGE 1	BLOCK 1	Introduction	20 hours		Feb
	BLOCK 2	Stage One: Subject study and application	40 hours		March
				Three weeks full-time	
STAGE 2	BLOCK 3	Part A: Planning	80 hours		April
		Part B: Classroom methods			
		Part C: Classroom management			
		Part D: Assessment			
		Part E: Whole curriculum			May
					June
	BLOCK 4	Stage Two: Subject study and application	80 hours		July
	BLOCK 5	Part A: Language and learning	90 hours		August
		Part B: Learning for all			
		Part C: Effective schools			Sept
					Oct
				Four weeks full-time	
					Nov
					Dec
STAGE 3	BLOCK 6	Stage Three: Subject study and application	12 hours		Jan
					Feb
					March
					April
				Six weeks full-time minimum	
					May
	BLOCK 7	Preparation for induction and further professional development	10 hours		June July

** Involvement in school-based activities across the 18 months (for example, parents' evenings, drama, music, and sports), three additional weeks. An additional two weeks teaching in another school to be arranged between Stage Two and Stage Three.*

School-Based Practice

Strategies for incorporating school-based practice into a program and the extent and nature of this assessment will vary according to the length and purpose of the program. Figure 12 below gives examples of ways in which the school practicum has been approached within some ODL programs.

In the Fort Hare, B.Prim.Ed. Program, a range of Key Activities, supported by a combination of individual self-studies, face-to-face discussions, and classroom applications are interspersed throughout the course. Abakhwezeli or tutors facilitate face-to-face sessions and provide school-based support.

In both the Fort Hare Program and the Open University PGCE, no activity, reading, or observation is included in the course that does not directly relate to school experience, and these program-school links are evident. All school activities also directly relate to the course structure and assessment model and allow for increasingly demanding activities that cover all aspects of the teaching role.

Module 7 What Are the Specifications for Determining Open and Distance-Learning Materials?

This is the opportunity to refine in detail the plans established in Module 5. A typical open and distance-learning course will consist of a study guide, lessons, activities, and assignments. These components can be organized in a number of different formats and delivered through a variety of different media.

Figure 12

Models of School-Based Practice in ODL Teacher-Education Programs (Perraton et al. 2002)

Model	*Examples*
1. No practicum offered at all	Certificate in Guidance, IGNOU (India)
2. College-based micro-teaching	Belize Teacher Training College
3. Classroom-based practicum as a separate block in a course, usually placed after academic blocks	Diploma in Education, IGNOU (India),
4. Classroom-based practicum supervised by visiting staff from college or ministry	Zimbabwe ZINTEC project
5. Classroom-based practicum under the guidance of a mentor within the school	Open University (Britain) Postgraduate Certificate of Education

1

1. How Can Study Materials Be Classified?

Study Guide: A study (or course) guide is a basic guidebook to an individual course or section of a course if the course is offered as part of a series. It explains the basic outlines of the course such as the goals and requirements, contact information for tutors and instructors, and assignment due dates. A course guide is usually in print form and appears as a detailed syllabus or textbook that guides the reader through the course and includes lessons and assignments.

A good study guide will integrate activities to keep students motivated and engaged in learning. Michael G. Moore and G. Kearsley, in their book, *Distance Education: A Systems View* (Moore and Kearsley 1996) recommends paying special attention to content and format in a study guide. Not only should the information be well-organized and clearly presented, it should also be entertaining and visually appealing. He suggests using pictures and diagrams to illustrate text, short blocks of print, and large margins for notes.

In his book, *Exploring Open and Distance Learning*, Derek Rowntree (1992) advocates simple and clear writing. He also recommends (and demonstrates) a friendly, open style of writing that mimics a conversation between the instructor and learner. Some of his suggestions include the following:

- Laying out information in clear lists, using bullets or other markers
- Asking questions within the text to stimulate learners' thinking
- Suggesting activities for learners that illustrate the lessons or ideas being discussed

Core Instructional Guidance: Core instructional guidance is the part of a course that conveys new information to learners. The print version may resemble a textbook with built-in assessment activities; assignments may be sent sequentially as individual packets to learners.

Activities: Activities provide opportunities for participants to practice the concepts they have learned through the core instructional guidance. Activities may be flexible enough to accommodate a diversity of participants and use different technologies. They may be designed for individuals, groups, or tutorials. Activities that are classroom focused and classroom based provide important learning experiences central to teachers' role.

Assignments: Assignments allow learners to use the ideas and perform the skills learned in a particular lesson or module. Assignments may encourage the learner to write a paper. This type of interaction would require the learner to review the relevant parts of the lesson. Assignments provide the primary interaction between instructor and learner or tutor and learner. Local support can provide detailed and specific feedback to learners on all assignments. Again, in teacher-education programs the assignments can be directly linked to classroom and school practice.

2

2. How Can School-Based Activity Be Included in the Program?

In teacher-education programs with school-based experience, the classroom-focused activities and assignments form a key aspect of the program and its assessment. Such activities highlight the relevance of the course to everyday practices. They can be further linked to school-improvement policies more generally.

Program developers must be aware of learners' conditions so that the activities will be relevant to their specific curriculum and classroom contexts. In this regard Instrument 8 may be helpful. Program developers must also make arrangements to strengthen, support, monitor, and assess such activity.

Document 10 can support discussions on the nature and place of school-based activity within the teacher-education program.

10

DOCUMENT

Document 10

Sample Pages from Fort Hare University, B.Prim. Ed. Program, Teacher-Learner Text, Umthamo, An Introduction to Technology Education, pp. 25–29

DOCUMENT 10

3

3. What Are the Options for Delivering Course Materials?

One of the most challenging aspects of ODL is using technology effectively to overcome the limitations of distance between instructor and learner. There is little research evidence to suggest that one medium of instruction or one mix of media is most effective in the design of courses. It is likely that text materials with local support will provide the main element in teacher-education programs, particularly where the overall resource budget is constrained. The costs for a range of different media can, however, be investigated locally.

(a) *Print:* Print is the more traditional way to mediate the distance between learner and instructor and is still the most widely used medium. Print is perhaps the most versatile of technologies because a book or pamphlet is easily shipped and distributed and is highly portable once it reaches a learner. Print is also cost-effective and relatively easy to produce. Word processing and inexpensive printers allow the flexibility to print out the exact number of materials needed. Fax machines, which are often widely available, can also be used to support printed materials.

(b) *Audio:* Audio technologies, such as cassette tapes and the telephone, have been called the most underutilized of technologies for distance learning.

(c) *Cassette Tapes:* These can be used to record a study guide so that learners can have the option of listening rather than reading. They also supplement print materials with examples of skills or ideas contained in a printed lesson. Cassette tapes can store a lot of information and are relatively inexpensive, easy to use, and portable. In most countries, many people have access to a cassette player.

In Northern Thailand, cassette tapes successfully replaced lessons broadcast by radio. Because the area is poor and mountainous, reception was not clear enough for some learners to access broadcast lessons. The radio broadcasts were recorded at a central education office and sent to the individual schools so that students there could hear the lesson.

(d) *Video:* Video has been used in many different forms for distance education. Video is suitable for a range of subjects, especially those in which a visual example is helpful. Video has also been used to provide face-to-face contact through video conferencing. In addition, ***videocassettes*** have been used successfully as both the primary form of instruction in distance-education courses and as supplementary materials. Video is particularly valuable in teacher-education courses as it allows

users to study clips of real classroom practice and can also provide an important stimulus for teacher-tutor discussions.

(e) *Broadcast:* Broadcast media use ***radio*** and ***television*** to broadcast lessons and assignments over a vast area. Throughout the course, lessons are broadcast at regular, fixed times; sometimes telephone or other audio devices are used to allow interaction between instructor and learner. **Document 5** provides an account of how national television was used in a short CPD program in Albania.

(f) *Disc-based:* The ability to store large amounts of data on small, easily portable discs has been an important development of the digital age. ***CD ROM*** stands for compact disc [with] read-only memory. Most computers are equipped with internal CD ROM drives. CD ROMs have been used in several ways in distance education.

CD ROMs, also known as interactive CDs, have been designed as an entire course. In this type of course, the learner inserts a CD into a computer, and the computer guides the student through the lessons and assignments.

CDs have also been used to provide large amounts of supplementary materials, such as entire encyclopedias or conference proceedings, in a small and easy-to-ship package. As technology advances, the cost of producing a CD ROM is falling, and they are now relatively cheap to produce in many parts of the world.

(g) *Digital Video Discs (DVDs):* These are similar to CD ROMs and are becoming a more cost-effective and practical way to deliver large amounts of information over long distances. DVD drives can be installed in personal computers, be a separate component of a home video system, or even a small hand-held device. They have a larger capacity than CDs, and are therefore used for similar purposes but also incorporate more video and interactive features.

CD ROMs and DVDs can be particularly effective in delivering multimedia materials such as audio and video that enable teachers to explore real classroom practices.

Interactive Media

- **Telephones** are usually used as a supplementary medium of instruction in distance-education courses. They are used in conjunction with television or other broadcast media to allow two-way communication between learners and instructors. They are also substitutes for face-to-

face contact that allows students to call in questions of a tutor rather than travel to a study or resource center. In some places, it may be cost-effective to use telephone conferencing for study groups or as part of a course design. Telephones can be expensive, however, and not everyone has access.

Telephone use has been successful in providing access to tutors at learning centers at the Open University in the United Kingdom. The learning centers are staffed by tutors who assist with specific course questions and by a full-time staff that provide answers to administrative questions. The learning centers are located throughout the United Kingdom so a phone call is usually local and inexpensive.

The conveyance of technologies embracing cell or mobile phones and computers gives new possibilities for online access that need to be kept under constant review.

- **Interactive Radio** has been used extensively in different parts of the world. A major national program for primary teachers and primary teachers of mathematics has received wide international recognition. Evaluations show significant gains for children in the interactive radio classrooms compared to classes without the resource. Burkina Faso uses a French-supported program, "Radio Scolaire"; in 1998, Guinea's National Institute for Research and Pedagogical Support (INRAP) initiated the broadest interactive radio instruction (IRI) program in Africa to train teachers in the use of IRI and child-centered approaches to teaching. In the 2000–01 academic year, IRI was introduced to grades one through six in every school in the country. Early evaluations show that the rate of learning increased at least 6 percent as compared to control groups'. Print materials, posters (in grades one through four), and science kits (in grades five and six) supplement the radio broadcasts. This is the first instance in West Africa of an IRI program going to scale at the national level; hence it is undergoing a broad array of evaluations. More recently radio offers new forms of interactivity such as the use of text messaging from mobile phones to comment on radio programs or drive content. Mobile phones can also be used for phone-in programs involving much larger audiences in debate. This approach is being used in the Teacher Education in Sub-Saharan Africa Progam (TESSA) to raise awareness of teachers' experiences and debate new approaches to pedagogy.

Use Document 11 to explore the potential uses of interactive radio and to consider (a) which technologies can be used within the program and (b) which technologies might be planned for in the future.

(Use and update the information gathered in Instrument 1, Scoping a Program, to help with this activity.)

11

DOCUMENT

Document 11

Interactive Radio Instruction

DOCUMENT 11

- One of the fastest growing means of communication is the use of electronic mail or **e-mail**. E-mail is popular because it provides an easy, flexible, and, in most countries, inexpensive way to communicate. For distance education, the advantage of e-mail is that it allows effective and timely communication over long distances. This is especially important for keeping learners in touch with instructors, tutors, and other learners. E-mail offers a financially viable alternative to slower, and possibly less reliable, regular mail service. Texting through SMS is also a potential communication media. The University of Pretoria now communicate about materials delivery, assignments, and examinations to around 10,000 students using SMS.
- The ***World Wide Web (WWW)*** and the ***Internet*** are still expensive to use in most developing countries, but their use is increasing. If regular use of these technologies is beyond the budget or feasibility of a program, participants can still be encouraged to use these new technologies as supplementary materials for assignments. The web can provide access to large amounts of information on a variety of topics. One of the most valuable parts of this phenomenon is the ability to access databases that contain a variety of information, up-to-date materials, research on developments in education, and access to electronic journals. ***Computer-mediated discussions*** can also be held via the Internet, and these in turn support professional networking **(see Document 13)**.

As indicated in Module 2, rapid changes in the potential of new communication technologies, changes in connectivity patterns, and an

increasing trend to reduce the prices of equipment and connection costs requires vigilant monitoring by developers of open and distance-learning programs for teachers.

The chart in Instrument 10 can facilitate a discussion of materials and technologies appropriate to the program's context and purposes. As new possibilities emerge you may wish to supplement the possibilities. The case studies in Documents 11, 12, and 13 also support this process.

10

ACTIVITY

Instrument 10

Selecting Course Materials and Technologies

INSTRUMENT 10

Use Documents 12, 13, and 14 to consider (a) which technologies can be used within the program and (b) which technologies might be planned for in the future.

(Use and update the information gathered in Instrument 1, Scoping a Program, for this activity.)

12

DOCUMENT

Document 12

Chile's Learning Network

DOCUMENT 12

13

DOCUMENT

Document 13

Exploiting the Potential of Electronic Conferencing in Developing Open and Distance-Learning Courses for Teachers

DOCUMENT 13

14

DOCUMENT

Document 14

Missing the Connection? Using ICTs in Education

DOCUMENT 14

Documents 4, 5, 9, and 12 provide detail of the materials and technologies that were selected by program designers in developing effective teacher-education courses. In South Africa, the Fort Hare Program relies on two resources locally available to open and distance-learning programs, text and tutor support. The tutors or Abakhwezeli (singular: umkwezeli) provide a key structure for the program. Organized through regional centers across the Eastern Cape Province, their tutorials are closely linked to the text materials, school activities, and visits. This arrangement is only possible through a partnership between Fort Hare University and the Eastern Cape Education Department. In Chile, as in Albania and Egypt, a wider range of technologies has been used. In most countries the first few years of this century are seeing a marked change in connectivity and access; programs will increasingly be able to exploit this potential.

In general, effective learning materials should do the following:

- Model good teaching and learning
- Focus on the classroom and school
- Integrate theory and practice
- Link to specific teacher-assessment outcomes
- Plan for teachers to progress
- Be developed by people who have successful school experience
- Aim for high quality and offer an informed and friendly style.

Module 8 What Is the Nature and Role of the Local Support Structures?

Local support plays a key role in all the programs cited in this toolkit. Important questions are where to find such support and how it is organized.

1. What Are the Potential Sources of Support?

Programs have addressed these issues in different ways. At Fort Hare the local support is in the form of professionals employed by the regional education authority. In Albania it was primarily staff employed by the National Pedagogic Institute, the organization responsible for CPD. In Egypt it was inspectors from the regional governorate authorities. In the United Kingdom the Open University normally appoints its own tutors, called associate lecturers. In each of these programs a system for monitoring the effectiveness of local support was built into the program plan. Where support is linked to teacher and school improvement, some of the costs may be borne by national or regional authorities (as in Fort Hare).

In-school support may also be provided by school principals or other senior staff with the relevant experience or expertise. At the Open University, a range of experienced staff take on the formal role of mentor with explicit course-based responsibilities. Schools receive payment in return for a certain level of support. Mentoring can be a very effective form of local support, but if school-wide systems are to be put in place, experienced staff must be available to all schools. This is often difficult to achieve, particularly in the primary sector of countries that have traditionally relied on a large proportion of unqualified or underqualified teachers. Programs are most effective when materials are written with the role of the support tutor in mind. These allow the support tutors to link their support to key aspects of classroom activity.

Increasingly, where connectivity and access exist, e-mail and computer conferencing environments can be used. **Document 13** provides a brief account of how this functions in the UK Open University's PGCE. Even where connectivity and access do not exist at the teacher level, programs can now consider using electronic communication among core central and dispersed staff. This builds capacity in ways that provide a foundation for a later roll out to schools and teachers.

2

2. What Characteristics Should Support Structures Exhibit?

A five-point analysis is set out below:

1. Support should provide model learning environments: teaching and learning should mirror what is expected of the best practice in students' own school and teaching contexts (for instance, face-to-face provision, written communication on course assignments, one-to-one support, or electronic conferencing). This has critical implications for the provision and development of tutor and mentor training.
2. Support should build on existing frameworks as far as possible and be consistent with the local culture: using existing structures is often significant in fulfilling this purpose.
3. Support should be developmental and exploratory, providing experience of a variety of teaching and learning opportunities. It should seek to challenge traditional dichotomies such as the distinction between the transmission of knowledge and learner-centered approaches, theory and practice, and teacher and learner.
4. Support should recognize and build on the variety of professional experiences of its participants; distance-learning courses traditionally attract adults with a wide variety of experiences and expertise.
5. Support should acknowledge both the private and professional aspects of learners' experiences and their interconnectedness (sic) in the development of learning (Leach 1997).

Module 9 What Systems of Assessment and Quality Assurance Can Be Put in Place?

Assessment of individual teachers and quality assurance of the overall program can be designed to complement each other. Both provide important information about the success of the program, and the program's impact on individuals and the larger education sector.

1

1. What Are the Options for Participant and Teacher Assessment?

The assessment strategy plays a key role in improving classroom practice. Courses with this focus set a curriculum of school-based activities that the teacher carries out in the classroom. The teacher then reports to a supporting tutor through assignments. These comprise a ***portfolio of development***. A portfolio may include pupils' work and commentaries by

teacher observers. **Figure 13** diagrammatically shows that a portfolio may include a range of evidence.

POINT FOR DEVELOPMENT

The participant-assessment strategy, like material development, can focus on core skills and competencies that the program is seeking to enhance. Program developers need to be clear from the outset on how these are developed.

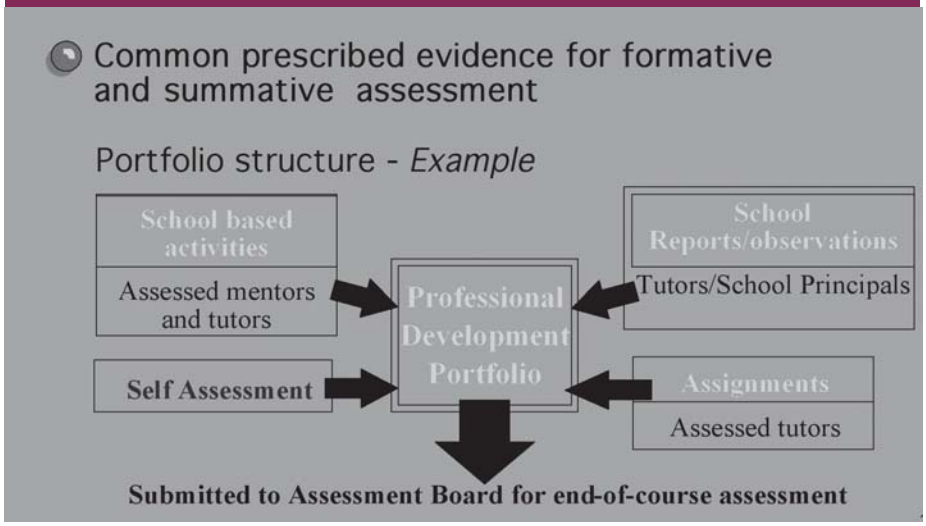
A competency or outcomes-based approach is increasingly being adopted at all levels of teacher education and training. Traditionally, the assessment aspects of a program were considered after other materials had been developed. In the new context, assessment is built into the program at the outset. The program design and curriculum must address the defined outcomes, and the assessment system must ensure that verifiable evidence is sought to confirm desired outcomes.

Traditional Examinations may still be required in some contexts. The logistics of teachers missing school to travel to an examination center can be difficult to organize. However, if a local tutor exists to verify work and mark assignments, the necessity of formal examinations diminishes.

The assessed work of teachers provides useful information to incorporate into a quality-assurance framework. Systematic data gathering on program

Figure 13

Issues for Teacher Education by Distance Learning: Assuring High-Quality Assessment



Source: The Open University of the United Kingdom (UKOU)

implementation allows ongoing development and improvement. Generally there ought to be at least two processes checking the key elements of the course. For example, appointed external assessors might conduct formal evaluations, and teachers might be asked for their evaluations of the course. School-based programs may be monitored by the school principal and through visits by a support tutor. These complementary assessments provide helpful information on the quality of the course.

2

2. What Are the Options for Quality Assurance?

Quality assurance is most effective if conducted on an ongoing basis while the program is in process. ***Process***, or ongoing, ***evaluations*** usually occur midway through a course or program to ensure that the course is maintaining standards of performance and is meeting the needs of participants. A process evaluation is also designed to help instructors and tutors improve the course while it is being conducted and simultaneously to help designers improve the course for future learners.

Process evaluations are usually designed to take a "snapshot" picture of a course to see if learners, tutors, and instructors are satisfied. If the evaluation is positive, no further work is needed. If, however, the process evaluation reveals problems, changes can be made and another process evaluation undertaken to ensure the original problem is solved.

Process evaluations can use many methods or combination of methods. Some of the options include:

- ***Focus groups*** (composed of learners) can be conducted to assess attrition, quality, and costs.
- ***Interviews*** with a group of learners, tutors, instructors, and others affected by the process of the course can provide insight into the course's performance in terms of attrition, quality, and cost.
- ***Observations*** of tutorials and study groups provide information to answer evaluation questions. This, however, may afford only a limited perspective because a large part of distance-learning education happens in a learner's home.
- A ***survey*** of learners that includes a variety of carefully crafted questions could provide the type of information needed by tutors, instructors, and course developers.

- A ***combination*** of the above methods can gather information from a variety of perspectives. The combination approach can also be a way of verifying the information.

Process evaluations can be conducted either by an external expert or by a tutor or instructor. Data for a process evaluation should be collected at the beginning of the course for comparison both at a later specified point and at the end of the course.

Instrument 11 asks key questions about process evaluation. Use this instrument to facilitate the process-evaluation stage of development.

11

ACTIVITY

Instrument 11

Process Evaluation

INSTRUMENT 11

External consultancy support may be necessary to design the overall program of quality assurance and to produce the instruments (monitoring forms and self-evaluation questionnaires). Collecting and analyzing the information require a formal data-management system. The processes and the resources involved need to be incorporated into the program at the outset.

Finally, when all aspects of the program design have been worked out in detail, it is important to check the following:

- Whether decisions on each dimension are in harmony with the other dimensions (do the plans for materials development, for example, take account of the role and impact of a local tutor?)
- Whether the decisions are affordable, given the resources available
- Whether the target number or geographical reach of the program originally envisaged remains constant

Conclusion to Program Start-Up

The reputation of programs depends crucially on early success, including positive teacher feedback on course experience. Given the scale of need and demand in many contexts, there can be a temptation to admit numbers that overstretch the new system. For the program developer a fine balance has to be drawn. Open and distance-learning systems need to be of reasonable scale to be cost effective and to justify the considerable outlay of resources at the commencement of a program. Small-scale pilots do not test out systems working to scale. On the other hand a rapid drive to very large numbers can test systems to destruction. Whatever the political and policy pressures, caution in the first year or two may reap dividends over time.

By completing the activities in **Program Start-Up**, the following key issues have been pointed out:

- Nature of curriculum organization
- Learning materials to be developed
- Role of school-based activity
- Use of instructional and interactive media within the program
- Nature and role of support structures
- Quality assurance and assessment issues

Contents

Overview of Modules 10

Overview of Module 10

In this toolkit a distinction is made among assessment, quality assurance, and evaluation. There are clear interrelations among these terms, so some explanation is necessary. Each term has a specific focus. For assessment the focus is individual student achievement and outcomes. Quality assurance focuses on regular reviews of program components (including assessment data) that can be used by the program director and the program team to review and modify program design details. Evaluation is focused on the more general overall success of the program to achieve the main purposes established at the scoping phase.

Evaluation has been defined as "the systematic assessment of the operation and outcomes of a program or policy compared to a set of explicit or implicit standards, as a means of contributing to the improvement of the program or policy" (Weiss 1998:4). Criteria for program evaluation are commonly focused on the primary challenges faced by open and distance-learning programs:

KEY QUESTION

- **Quality:** Open and distance-learning courses, like conventional programs, can be of varying quality. How can evaluation evidence be used for program review and improvement?
- **Cost:** Open and distance learning, to be cost-effective, must use economies of scale. How transportable is the cost model and how is information about cost-effectiveness incorporated into program review?
- **Completion:** one of the key program indicators. What percentage of students embark on the program successfully?

Such overall evaluations may be the responsibility of the program team or be given to an external evaluator to implement. The audience for the information derived will most commonly be the key policy stakeholders who initiated the process. Although the process of evaluation takes place when the program is underway, the design of the evaluation can take place in the phase of program start-up. This is a key activity and, whereas policymakers and planners may stand back from the program team start-up activity, it is important that they reengage at this summative stage.

Module 10 What Are the Options for Designing an Evaluation System for Open and Distance-Learning Programs for Teacher Education?

1

1. What Forms of Evaluation Should Supplement the Quality-Assurance Framework?

Most teacher-education systems function with a minimum of external evaluation. External examiners may work to monitor standards, but questions about overall effectiveness (completion rates and teacher perceptions) are rarely asked. Program leaders working in a context of external funding are wary of the additional pressures of external evaluation. They may have had to develop the program in the context of some suspicion and now be subject to evaluation that is not applied to others working in more conventional situations.

If an effective quality-assurance scheme is in place, a significant level of information should be available to external evaluators. This can be matched by evaluator visits to schools, discussions with teachers, and reviews of the systems and infrastructure that have been put in place.

2

2. When Should the Program Be Evaluated?

Commonly, there are a number of points when projects may lose momentum.

- At an early stage, when setting up a team and recruiting
- When an overly ambitious estimate of materials production proves difficult or impossible to deliver
- When inadequate systems and infrastructure development lead to administrative confusions as teachers first enter the program

Good scoping and program design help to ensure this does not happen. Targeted consultancy can also help.

An appropriate moment for external evaluation is at the midpoint of the first presentation of the course; the targets established in the program design set the agenda. At this early stage the evaluation will not look for quantitative evidence of the number of teachers who have successfully completed the courses or any significant impact on classroom practice. The evaluator will look at the effectiveness of the materials, the balance

between self-study materials and local support, and the assessment and efficacy of quality-assurance systems. **Instrument 12** outlines the criteria that can be used in making judgments about each program component.

An appropriate moment for another evaluation is at the end of the course or program. This is often referred to as outcome evaluation. ***Outcome evaluation*** is an evaluation of the results of a particular course or program. The purpose of outcome evaluation is to evaluate if, and how well, the course achieved its goals and whether it should be offered again. Outcome evaluation provides information to measure and describe the learning that takes place by the end of the course and the impact this has on the targeted audience and policies. Outcome evaluations are usually conducted by program staff, instructors, or external evaluators. Information from the process evaluation can be integrated into the outcome evaluation to get a fuller picture of how specific indicators have changed.

3 3. What Criteria and Indicators Should Be Used to Judge Effective Implementation, Especially in Terms of the Impact on Teaching and Learning?

KEY MESSAGES

Important aspects of program evaluation include assessing effectiveness, the extent to which targets have been achieved, and the impact on the teachers and school system. Program evaluation also provides feedback for program modification and development and analyses that can be used by others attempting similar programs. Increasingly, government and regional authorities, and particularly donor and other funding organizations, are asking for such evaluations.

It is strategically important to be in agreement with the local policy and program leaders on the form and timing of such an evaluation. The concluding part of the cycle of scoping and implementation could well be considered most usefully at the early stage of program design.

Criteria for outcome evaluations are based on efficacy and utility. Criteria are selected to provide information that improves the program and determines if it has met its goals. Therefore a review of program goals is useful at this time to develop specific questions that may be addressed in an evaluation. These particular questions help evaluators develop effective instruments.

In addition to effectiveness and usefulness, cost-effectiveness should also be considered. Some useful questions in developing an outcome evaluation might include:

✓ ***Effectiveness:*** Did the course sustain learners' interest and motivation?

- How many learners completed the course? How many of these learners passed the course and received a certificate or diploma?
- How did learners interact with the course materials, technology, tutors, and administration?
- Did the course meet its stated goals?

✓ ***Usefulness:*** Did the course meet the learners' expected standards of teaching and content?

- Were learners satisfied that they acquired the concepts and skills they needed and expected? Can they demonstrate this learning by performing those skills?
- Was there a measurable change in the participants' level of understanding and ability to perform related skills by the end of the course?
- Were the course materials and media easy to understand and to use? Would the learners use the course materials for future reference?

✓ **Cost-effectiveness:** Was the course cost-effective, both for the individual participant and for the program?

- Were the instructional methods cost-effective?
- Was the medium that was used for course delivery and instruction cost-effective?
- Did the course have an impact on teaching and learning in classrooms?

An outcome evaluation for a course can involve a number of the following methods, alone or in combination.

- ***Focus groups*** can be conducted in which groups of learners meet with an evaluator for a structured discussion about how the course was successful, and how it can be improved.
- Individual ***interviews*** can be conducted with a number of learners who have completed the course to note their opinions.
- ***Surveys*** can also be distributed to students asking them for a variety of responses regarding their experience with the course.
- A ***combination*** of these methods can also be used to gain a wider variety of views and deeper perspective on how the course was successful, and which areas need improvement.

Data for an outcome evaluation is generally collected at the end of the course, but may also be collected at the beginning for comparison purposes. For example, individual assessments of a teacher at the beginning and at the end of the course by the same student could determine if a course improved a teacher's pedagogical skills. Any changes of information might be attributable to the course.

Use the criteria in Instrument 12 in designing evaluation processes. They may also be introduced in the earliest stages of planning to indicate the quality targets that may be achieved.

12

ACTIVITY

Instrument 12

Criteria for Judging the Elements of Open and Distance-Learning

INSTRUMENT 12

Contents

1 Reviewing National Strategies towards Open and Distance Learning

ISSUES	QUESTIONS TO ASK
Preparing national strategies	How are ODL and ICT part of the country-led reform process? (Is one in place or planned?)
	How is this strategy set within a framework to develop education as a whole?
	Is the strategy linked directly to significant educational goals? Other developments in telecommunications?
	How does the strategy allow for content development and testing?
	How will these issues be assessed realistically? ■ Available infrastructure? ■ Institutional capacity? ■ Costs? ■ Means of finance?
Building on what has worked	Does the national framework on education call for more, better teachers? If so, has the country provided teacher development at a distance? Does the national framework call for improving the quality of primary education? Does radio reach all schools? Does the national framework call for expansion of tertiary education? Has open and distance learning been used in the past?
Investing in innovation	■ How will the initiative build on local infrastructure and experience? ■ Has the initiative been tested in a pilot project before expanding? ■ Has an evaluation been conducted? Is one planned?
Containing costs and supporting long-term financing	How will high-level, fixed costs be managed? ■ Loans or grants ■ National budget ■ Student fees
Managing recurrent costs	Will external financing be used? ■ For going to scale ■ For containing costs of technologies (favorable purchase policies, telecommunications connections, access to broadcasting) ■ For student fees
Supporting national capacity for program design and management	What policies and incentives will attract high-quality personnel? What resources, public and private, need to be mobilized to attract expertise in design and management?
Creating partnerships inside and outside the country	Have the economies of regional cooperation been considered to: ■ Maximize technical expertise? ■ Reduce the burden of high fixed costs? ■ Increase the number of learners? ■ Share experience? Have in-country partnerships been sought with other stakeholders such as: ■ Telecommunications industries? ■ Other private-sector partners?
	Source: Murphy, Paud, S. Anzalone, A. Bosch, and J. Moulton. 2002. *Enhancing Learning Opportunities in Africa: Distance Education and Information and Communication Technologies for Learning.* Washington, D.C.: the World Bank.

1 DOCUMENT 1

Three scenarios for teacher education offered at a distance

In the mid 1990s, shortly after the move in South Africa to a government of national reconstruction, an audit of teacher education was carried out. One part of the audit was a study of teacher education at a distance. The authors of the report explored the relationship between distance education and conventional face-to-face college or university provision through an analysis of three possible scenarios. The report was critical of the quality of most teacher education through open and distance learning in South Africa. The juxtaposition of these three scenarios can serve to initiate dialogue on the comparative merits of a new program of ODL in relation to the existing provision.

Possible Futures

This study explores existing distance education in South Africa. Serious problems exist that call for drastic restructuring. In the critical areas for policy decision, three scenarios emerge. The first scenario is one of status quo:

Scenario One: Tinkering with the System

This scenario proposes a status quo position. The few suggested reforms are financial cutbacks and physical resourcing (building new lecture halls and colleges). Some policy work will be done to achieve a system that is cheaper (rather than more cost effective), financially accountable, and administratively efficient. Little change is likely to occur in expensive and difficult areas such as curriculum reform or in politically sensitive ones such as quality assurance or college closures and staff retrenchments.

In this scenario, the following are likely to happen:

- Poor-quality courses will drive out high-quality ones as curriculum development and student support are expensive.
- Large providers will force out small providers as large providers benefit from economies of scale.

In South Africa, this is likely to kill the little innovation that does exist and allow distance education to continue with minimal student support.

Market-driven education systems tend to encourage competition. In higher education in South Africa, this has definite consequences for quality and equity. There are too few competent writers to produce high-quality courses; too many courses compete for too few students; and new courses of poor quality will appear as institutions compete for students. Prices will be driven down, but so will quality. Moreover, it is likely that the students studying at these "second-rate" providers will be the historically disadvantaged: the poor, rural residents, black Africans, and women.

Distance education will be regarded as the "poor relation" in teacher education. However, distance education will continue to expand as predominantly black African women teachers upgrade qualifications. Because of the poor quality of distance education, there will be little improvement in schools, but the cumulative costs of teachers' salaries will deplete needed funds. The quality of education in South Africa is likely to spiral downward.

Scenario One would be a disaster. Scenario Two conceives of an immediate and drastic restructuring of the distance-education sector.

Scenario Two: Restructuring Teacher Education at a Distance

This scenario proposes an overhaul of the distance-education sector but maintains distance education as a separate sector.

Better courses are produced, small providers collaborate to ensure cost-efficiencies, and more regionally based tutor support is improvised (often using contact colleges as tutorial spaces). However, change in the system is difficult. Old notions about correspondence study are tenacious and, although numbers are large, they are insufficient in asserting distance education as the most important education sector. Tradition dictates that in a system that separates distance and contact study, the latter is seen as the "real" education and the former remains the lesser option. This is exacerbated by the fact that mainly poorer, often black African women, study at a distance while wealthier, urban males take time off to study through contact means.

The problem emerges that important educational aims, such as CPD, are unrealized because of the vested interests of contact colleges and the poor image of distance education. The more effective materials—both print and video—do not enter contact colleges. These institutions then face a scarcity of appropriate texts and inadequate expertise in certain subject areas. Distance-education colleges have largely surmounted these

problems as they rely on courses that are produced by smaller teams and tutored by non-subject specialists.

In a sense, neither sector succeeds. Distance education remains tainted as inferior education but expands because it is cheaper to use. Contact education is regarded as good education but faces various shortages that affect quality and pressurize staff. It is expensive, and is, therefore, contracting. Instead of taking advantage of new technologies that integrate distance and contact education to create a mixed-mode system (with cost, skills, and equity advantages), both sectors in South Africa suffer in different ways.

Although certain temporary measures must occur to save money and time, it is imperative that these facilitate the development of Scenario Three, which proposes an integrated teacher-education system.

Scenario Three: Moving to an Integrated System

Scenario Three proposes a system committed to open learning in which all institutions are re-created as mixed-mode institutions. It requires a systemic overhaul so that resource-based learning becomes the basis of all teacher education, with the provision of targeted contact teaching for skills training.

The system works through a national agency, which enables a network of colleges and sites to cooperate in delivering quality education. Some courses may be run entirely through a nationally developed distance-education center, others may be developed by local cooperatives and shared nationally.

Regional cooperation and national networking is given priority. Most education will be school-based but supported by resources and mentors employed through a local college (or consortium of colleges). The market may be used to select materials, but unproductive competition and duplication will be avoided through the national network and incentives for collaboration.

Rapid developments in digital technologies are exploited to make the system increasingly cost-efficient. The savings enabled by an integrated education system and administrative efficiencies made possible by computer networking persuade the National Department of Education to invest heavily in this type of infrastructural development rather than in building more lecture theatres and colleges. Surprisingly, networking

integrates historically disadvantaged colleges, particularly in rural areas, more effectively than expensive and rigid old development technologies. Because of its commitment to equity and justice, the new system thoroughly researches the implications of new technologies for learning and for inequities in power and wealth in a divided society such as South Africa. It also makes media literacy an important part of new teacher-education curricula.

Contents

2 Pre-Service Education and Training Program: A Review

KEY QUESTIONS	NOTES
1. What is the institutional context for teacher training?	
2. What are the numbers entering training courses?	
3. What is the average completion rate?	
4. What is the length of the course(s)?	
5. What is the cost per student for each of the courses identified?	
6. Do any national or local regulations apply to this training?	
7. How are the quality of the courses and the outcome of training determined?	
8. Are there any plans to reform the institutional context of teacher training or the context of the courses?	
9. What percent of qualified teachers enters the teaching work force?	
10. Is the teacher-training population fully representative of the local community?	

3 In–service Qualification-Upgrading Programs: A Review

KEY QUESTIONS	NOTES
1. What is the institutional context for teacher training?	
2. What are the numbers of teachers entering training courses?	
3. What is the average completion rate?	
4. What is (are) the length of the course(s)?	
5. What is the cost per student for each of the courses identified?	
6. Do any national or local regulations apply to this training?	
7. How are the quality of the courses and the outcome of training determined?	
8. Do any plans exist to reform the institutional context of teacher training or the context of the courses?	
9. What is the benchmark qualification that is nationally or regionally targeted and what percent of serving teachers has attained this qualification level?	
10. Are there any links between upgrading courses and national or regional programs of school improvement or CPD for teachers, and which local personnel might be involved in supporting such programs?	

4 Continuing Professional Development (CPD) Programs: A Review

KEY QUESTIONS	NOTES
1. Is there any requirement for teachers to participate in CPD?	
2. What institutional contexts exist to support CPD? Do any of these exploit open and distance methodologies and the use of interactive technology?	
3. What is the length of the course and do any national regulations or local plans for reform exist?	
4. Can any estimate be made of the frequency with which qualified teachers participate in CPD?	
5. Can any estimate be made of the cost of the average course?	
6. Can the national or regional budget for CPD be established?	
7. Is there any formal process for identifying priorities for CPD provision?	
8. Does any system of teacher appraisal exist and if so, is this linked in any way to CPD provision?	
9. Do school principals have any responsibility with respect to CPD for teachers?	
10. Do any mechanisms exist to control the quality of CPD provision?	

5 Stakeholder Grid

STAKEHOLDER:	SCOPING	CREATING	IMPLEMENTING	EVALUATING
A. Name, position				
1. Who do they represent?				
2. Why might they be supportive?				
3. What expertise do they offer?				
B. Name, position				
1. Who do they represent?				
2. Why might they be supportive?				
3. What expertise do they offer?				
C. Name, position				
1. Who do they represent?				
2. Why might they be supportive?				
3. What expertise do they offer?				

Stakeholders who might oppose the program:

STAKEHOLDER:	SCOPING	CREATING	IMPLEMENTING	EVALUATING
A. Name, position				
1. Who do they represent?				
2. Why might they be opposed?				
3. What can be done to address their concerns and overcome their opposition?				
B. Name, position				
1. Who do they represent?				
2. Why might they be opposed?				
3. What can be done to address their concerns and overcome their opposition?				
C. Name, position				
1. Who do they represent?				
2. Why might they be opposed?				
3. What can be done to address their concerns and overcome their opposition?				

2 DOCUMENT 2
Uganda: A Response to Teacher Supply

Uganda's primary education system was devastated by political unrest in the 1970s and 1980s. While schools continued to function, teachers were in short supply and about 56 percent of the primary teachers were untrained. When the political situation became more stable, a number of upgrading courses at-a-distance helped upgrade the qualifications of teachers in the classroom. For example, the Mubende Integrated Teacher Education Program (MITEP) aimed to upgrade teachers'qualifications in the Mubende district of Uganda and used 22 printed self-instructional booklets, tutor-marked assignments, five residential courses each of about two weeks' duration, group meetings every two weeks, and teaching supervision. Nine hundred teachers enrolled and about 700 completed the course three years later. Other districts had similar courses. In 1994, the government established the Teacher Development and Management System (TDMS) comprising a network of 18 core primary teachers'colleges each supporting about 20 Coordinating Centers, staffed by tutors, and each Coordinating Center in turn responsible for about 20–25 schools. This national system is used for a wide variety of purposes: management training and support to head teachers, district education officials, school community organs, pre-service training for teachers, in-service upgrading for practicing teachers through vocational courses and distance education, and ongoing in-service training to bring new methods, texts, and learning materials to teachers in school. The upgrading course builds on the work of MITEP and uses the outreach tutors to support Coordinating Center tutors who in turn support and supervise the underqualified teachers and the teachers' colleges to provide residential courses. About 10,000 teachers have been upgraded since 1996. The Universal Primary Education (UPE) UPE policy has led to a massive expansion of pupil numbers and a consequent deterioration in the pupil-to-teacher ratio. The supply of qualified teachers is not meeting the demand. Currently, there are plans to post about 20,000 secondary-school educated unqualified teachers to schools to reduce the ratio. The TDMS model is now being utilized to provide further upgrading.

3

DOCUMENT 3

Contemporary Ideas about a Third Age of School-Improvement Practice

This extract, from a paper by two leading experts in the field of school improvement, summarizes the characteristics of successful system-wide attempts at school improvements. The authors define this as a Third Phase or Third Age of school-improvement practice, which stresses the increased focus on pupil outcomes and teachers' professional development.

Third-age school improvement practice and philosophy attempts to draw the lessons from these apparently limited achievements of existing improvement and reform … There are course variations among these programs that make any global assessment difficult. Nevertheless, if one were to compare these exemplars of third-wave school improvement as a group with the groups of programs in evidence in phases one and two of the school improvement enterprise, it is clear that:

- There has been an enhanced focus upon the importance of pupil outcomes. Instead of the earlier emphasis upon changing the processes of schools, the focus is now upon seeing if these changes are powerful enough to affect pupil outcomes.
- The learning level and the instructional behaviors of teachers have been increasingly targeted for explicit attention, as well as the school level.
- There has been the creation of an infrastructure to enable the knowledge base, both "best practice" and research findings, to be utilized. This has involved an internal focus on collaborative patterns of staff development that enable teachers to inquire into practice, and external strategies for dissemination and networking.
- There has been an increasing consciousness of the importance of capacity building. This includes not only staff development, but also medium-term strategic planning, change strategies that utilize "pressure and support," as well as the intelligent use of external support agencies.
- There has been an adoption of a mixed methodological orientation, in which bodies of quantitative data plus qualitative data are used to measure quality and variation in that quality. This includes an audit of existing classroom and school processes and outcomes, and comparison with desired end states, in particular the educational experiences of different pupil groups.

- There has been an increased emphasis on the importance of ensuring reliability or fidelity in program implementation across all organizational members within schools, a marked contrast with the past when improvement programs did not have to be organizationally "tight."
- There has been an appreciation of the importance of cultural change to embed and sustain school improvement. There has been a focus on a careful balance between vision building and the adapting of structures to support those aspirations.
- There has been also an increased concern to ensure that the improvement programs relate to, and impact upon, practitioners and practices through using increasingly sophisticated training, coaching, and development programs.

These third-age practices and philosophies of school improvement (more fully described in Hopkins 200l), have only been in development for perhaps the last seven or eight years. Although it is possible to find small-scale elements of some third-age principles in the school improvement enterprise in its first and second phases. Nevertheless, taken together, these practices represent an innovative approach to generating and sustaining improvement in the context of substantial external pressures upon schools to improve, and of a more limited range of support to resource them in the task.

Source: Hopkins, D., and D. Reynolds. 2001. "The Past, Present, and Future of School Improvement: Towards the Third Age." *British Educational Research Journal 27(4): 462–63.*

4 DOCUMENT 4

The Educational Enhancement Program for Primary Teachers in Egypt

This document presents an implementation schedule for the primary teachers' distance-education program. Two courses, Stage One and Stage Two, were planned. The schedule indicates the timetables for capacity building, program development, course production, and support and training.

An outline of the program's course development is also included.

Planned Implementation Schedule for Educational Enhancement Distance-Education Program

1997

1997	CAPACITY BUILDING	PROGRAM DEVELOPMENT	COURSE PRODUCTION	SUPPORT TRAINING
PHASE 1	PHASE 1	PHASE 1	PHASE 1	PHASE 1
July	Orientation Workshops and Action Plan Development			
August				
PHASE 2	PHASE 2	PHASE 2	PHASE 2	PHASE 2
September	Steering Group Set-Up			
October		Detailed brief for all aspects of program development created by core directorial team		
November				
December	Director(s) and core directorial team appointed			

1998 Planned Implementation Schedule for Educational Enhancement Program Distance Education Program

1998	CAPACITY BUILDING	PROGRAM DEVELOPMENT	COURSE PRODUCTION	SUPPORT TRAINING
PHASE 3	PHASE 3	PHASE 3	PHASE 3	PHASE 3
January	Establishment of support-service team			Study tour for directorial and writing teams
February	Appointment of writing teams	Awareness workshop for central ministry staff		
March	Implementation teams identified in governorates piloting courses			Specialist input to writing teams
April				
May				
June			First draft of Stage One courses	Specialist input to core directorial team—for example, quality assurance—teachers' support
July		Training of inspectors in pilot program	Second draft of Stage One courses	
August			Rough cut of video	
September		Training of principals and teachers in pilot program	Third draft of Stage One courses	Development of external evaluation framework
October	Appointment of writing teams for stage 2 courses		Video finalized	
November			Audiocassette finalized	
December				

1999

Planned Implementation Schedule for Educational Enhancement Program Distance Education Program

1999	CAPACITY BUILDING	PROGRAM DEVELOPMENT	COURSE PRODUCTION	SUPPORT TRAINING
PHASE 5/6	PHASE 5/6	PHASE 5/6	PHASE 5/6	PHASE 5/6
January	Identification of governorate implementation teams for full-scale implementation of Stage One courses	Piloting and testing of Stage One courses begins		Workshop with directorial and writing teams
February			First draft of Stage Two courses	
March		Full-scale inspectors' training program		Specialist input to writing teams
April				
May				
June		Full-scale training of principals	Second draft of Stage Two courses	
July			Rough cut of video	
August				
PHASE 7/8	PHASE 7/8	PHASE 7/8	PHASE 7/8	PHASE 7/8
September		National launch of Stage One courses	Third draft of Stage Two courses	
October		Parental awareness documentary broadcast on television		Implementation of external evaluation framework
November			Video finalized	
December		Piloting and testing of Stage Two courses begins	Audiocassette finalized	

2000 Planned Implementation Schedule for Educational Enhancement Program Distance Education Program

2000	CAPACITY BUILDING	PROGRAM DEVELOPMENT	COURSE PRODUCTION	SUPPORT TRAINING
PHASE 5/6	PHASE 5/6	PHASE 5/6	PHASE 5/6	PHASE 5/6
January		Inspectors training associated with Stage Two courses		
February				
March				
April				
May				
June				
July				
August				
PHASE 9	PHASE 9	PHASE 9	PHASE 9	PHASE 9
September			Full-scale implementation of Stage Two courses	
October				
November				
December				

2001 Onward Development of Program

Course Outline for Distance Learning Modules in Egypt's Educational Enhancement Program

Subjects:	Mathematics and Arabic
Stage:	Lower Primary
Duration:	Six months
Number of pages:	80 to 100
Print size:	A44

Framework of the Course

General Objectives:

1. Provide the teacher with new teaching strategies
2. Develop the teacher's ability to effectively use education technology
3. Acquaint the teacher with new assessment techniques and new teaching strategies
4. Develop the teacher's ability for self-evaluation
5. Reinforce the teacher's motivation for in-service teacher education
6. Develop the teacher's self-learning skills.

Overview of Course Content, Objectives, Methodology, and Technologies Used

NUMBER OF MONTHS	OBJECTIVES	COURSE CONTENT	METHODOLOGY FOCUS	ACTIVITIES	TECHNOLOGY
Jan 1999	Design teaching strategies for creative use of the text book	Overview on the recent strategies	Games – brain-storming, story-telling	Using such techniques in class activities	Audio (teacher-made)
Feb 1999	Design a lesson plan covering the class various activities	Format of lesson plan	Planning a lesson	***Applying the activities included in the lesson plan***	Video
March 1999	Apply new concepts in class management	Different strategies for class management	Group, pair, or individual work participation of students	Using such techniques in class activities	Technical and non-technical resources
April 1999	Make use of resources	Knowledge about different resources of learning	Selecting suitable aids to teach different lessons	Using such selected resources	Video, audio, CDs, and other available resources
May 1999	Use different types of questioning strategies	Types, forms, techniques, aims and reasons of questions	To design and apply different types of questioning strategies	Using questioning types in communicative activities	Video, audio
June 1999	Assess students' and teachers' performance and course effectiveness	Aims of testing and examples of test items. Checklist for self-evaluation	Portfolio	Applying different types of tests in class	Video and printed materials

5 DOCUMENT 5

Albania's Kualida Program for the Continuing Professional Development of Teachers

In the mid-1990s, Albania faced the challenge of providing professional development opportunities for teachers. An open and distance-learning program was developed using text resources and broadcast television.

Use Instrument 4 to discuss the existing context for CPD programs.

The Kualida Education Development Program is a pilot project for the in-service training of elementary teachers (Grades 5–8) in four districts of Albania, including Elbasan, Skodra, and Girokastra, encompassing rural as well as town communities. The piloted courses arose from a feasibility study of open learning in the Albanian context. The study was commissioned by the Albanian Education Development Project (AEDP) as part of the Ministry of Education's development strategy. In creating the Kualida Program, AEDP adapted an open and distance-teaching strategy using expertise from the Open University in the United Kingdom but based the program development entirely within Albania. The acronym "KUALIDA," which approximates the sound of the Albanian word for quality, derives from the linguistic written expression of Training (*Kualifikimi*), Distance, and Teachers (*Arsimitareve*).

Impetus for this three-month program arose from the urgent need for teacher retraining in Albania as described above. The course was designed for teachers of English, French, history, and geography—all curriculum areas identified by members of the National Pedagogic Institute and by teachers as most in need of in-service programs. The main focus of the written course materials, distributed to 815 teachers, was methodological issues. In particular the program responded to a need for a wider range of individual and group teaching strategies in Albanian classrooms.

The 8l5 teachers in the pilot project were assigned in groups of 25 to a subject-specific *ëformatorí* (advisory teacher), responsible for three tutorials at the beginning, middle, and end of the program. Formators visited teachers in their classrooms and assessed their notebooks according to set criteria. The course materials provided a common frame of reference both for teachers working together and for visiting formators. Although

formators have conducted impromptu visits in the past, the program team emphasized that visits must now be by teacher invitation and conducted on an equal platform between teacher and formator.

All formators were given extensive face-to-face training in open learning methodology, in the course materials, and in tutorial provision. They were also provided written guidance on their role and on planning and running tutorials. In tutorials, links between school activities and the course materials were explored: A vital opportunity for discussing new practice outside the pressures of the classroom. Members of the program team visited some tutorials to evaluate and review the program. The combination of countrywide training, written guidance, and tutorial monitoring formed an important component of quality assurance within the Kualida Program and comprised the first phase of the program's evaluation.

Key Themes

"A lot of work needs to be done. New steps are always difficult," (History formator, Skodra).

An external evaluation of the project, encompassing all the pilot districts, was carried out. The data that is drawn on here included a questionnaire to the 815 teachers in the project (95 percent return); interviews with the director of education, formators, and inspectors in the four pilot districts; meetings with teachers in three out of four of the pilot districts; observation of lessons in each district; and review of teacher notebooks and tutor-planning documents. Three key themes emerged related to the issues raised in the first part of this paper: theory and practice, forums for inquiry, and transforming frameworks.

Theory and Practice

> "Under the old systems, students came into class, sat down, and stayed still. The teacher took attendance, checked homework, and recited or read the day's lesson. No questions. No independent thinking," (Science teacher, Shales).

The course is based on four short study texts, one for each subject area. The texts are designed around a common framework. A two-part introduction introduces distance education as a methodology. The first main section

focuses on methodologies that are new to Albanian teachers, such as teaching strategies (problem solving, brainstorming, and role playing), the use of questioning, and pupil assessment. The second section, Activities, provides teachers with exemplar material that may be adapted to their own teaching environments. Three 45-minute television programs, filmed in Albanian classrooms, complement the study texts and illustrate some of these teaching approaches.

These materials are innovative in two respects: The first is that they were written by academics from the National Pedagogic Institute and the University of Tirana in collaboration with practicing teachers in each of the four subject areas. The second is the way theory and practice are interlinked both within the study guide and in the program as a whole.

The teachers gave the course a good deal of importance. This was reflected in comments such as, "I worked for many hours to analyze the models," and "Kualida has taken up a lot of teachers' time." Seventy-seven percent rated the course materials as very useful or quite useful. Sixty percent said it had been very useful or quite useful in improving classroom practice. The critical linkage between theory and practice was a constant theme during the interviews with regional directors and classroom teachers. The phrase "close to teachers" was frequently used to describe how the writing team's knowledge of real classrooms had informed the materials. Whi1e the first month of the course allocated study hours solely to theory and tutorial time, from the second month onward, time for classroom-based activities ran parallel with time for text and tutorial study.

This approach has clearly had a major impact on the teachers in the project, with 53 percent evaluating the classroom activities as very or quite useful and 38 percent as useful. Some participants' comments include, "Kualida is close to the teachers—the methodology is useful but the practical element invaluable"; "theoretically speaking the methods are contemporary and the teachers are keen, practically speaking the materials are helpful"; and "the combination of text and practical activities is very successful."

Why are Albanian teachers interested in developing theoretical perspectives on classroom pedagogy? The interest may result from the inaccessibility of textbooks, media, or information technology; the teaching approach is all that is open to change. Furthermore, the experience of living under a totalitarian regime has also been a critical factor. "Kualida breaks the framework of the ex-regime"; "Kualida provides students with the opportunity to express independent thought and opinion..."; "...it

enables students to think freely for themselves"; "...teachers have gained more freedom, they are not forced into a framework"; and "...teachers feel more original." Such commitment provides an interesting contrast with accounts of educational change in Eastern Germany. There, many teachers have easy access to resources and new textbooks. Nevertheless researchers found that:

> Reforming teaching methods... is still on the back burner. This area is considered a deeply personal affair and indeed it hinges on a teacher's personality and style to a much higher degree than content. Schools are aware of a new message from staff-development centres (sic) that the new state-of-the-art pedagogy is student centred (sic), but experimenting with new methods of instruction requires a personal involvement in reform, which many teachers lack. In addition, not all things can be changed at the same time, and instructional methods are an area where nobody at this point interferes or exerts pressure (Weiler, Mintrop, and Fuhrman 1996).

Undoubtedly the program itself has raised the level of dialogue and debate among Albanian teachers. The course materials combined with carefully chosen classroom activities and a dynamic support framework have enabled the successful interweaving of theory and practice and made the process more transparent for many teachers. Formators and inspectors frequently stressed that teachers had hitherto been familiar with new methodologies but lacked confidence to transfer them into practice.

> Initially teachers thought that Kualida was not new to them. It was familiar theoretically in many ways, but in the long run the teachers were keen because of the practical aspects of the texts.
> Teachers are good at method, but when it comes to application this is less easy.

Source:

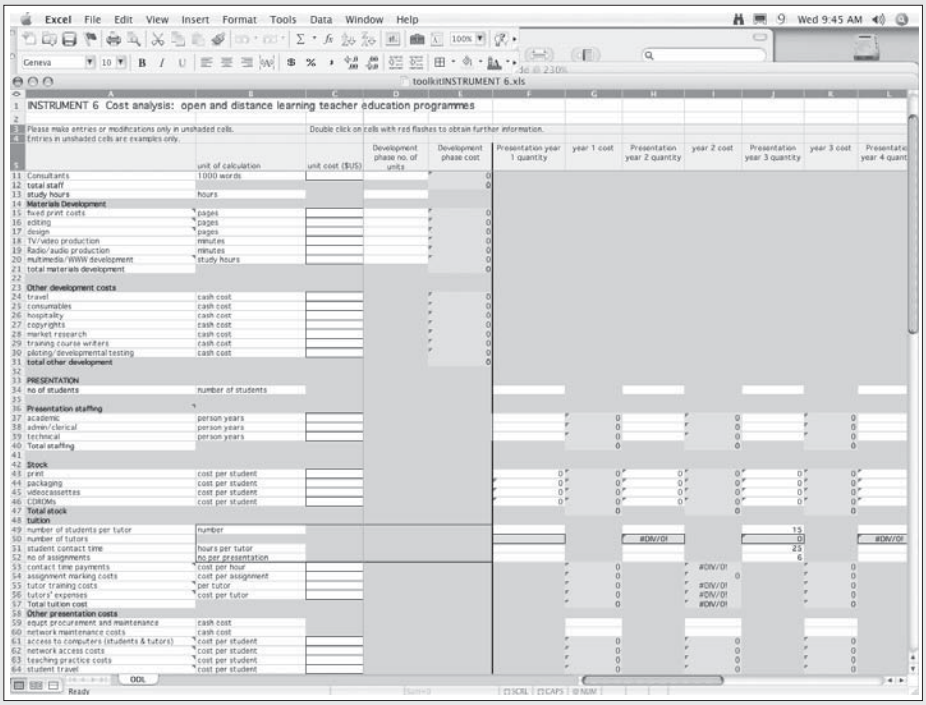
Leach, Jenny. 1996. "Teacher Education in Change: An Intellectual Practice. Issues for Albania." *Mediterranean Journal of Educational Studies* 1(2): 64–7.

Weiler, K., S. Mintrop, and J. Fuhrman. 1996. "Transformation, Teachers, Schools, and Universities in Eastern Germany." *The Stratford Series on Education and Public Policy.* London: Falmer Press.

Contents

6 Sample Cost-Analysis Spreadsheet

Instrument 6 is in the form of an Excel spreadsheet on the Toolkit's accompanying CD-ROM and includes brief comments on its use.



Develop and use this cost-analysis spreadsheet in the Scoping Phase.

This can be reconsidered in the Initial Development and Start-Up Phases (4 and 5) as program-planning expenses and cost issues are refined

7 Scoping a Program: Key Questions

Use this chart to record your response to the eight key questions presented in this section.

A. How can the purpose of the program be defined?	
1. What type of program is required?	
2. What is the focus of the program?	
3. How many teachers are required?	
4. Is the program compatible with existing education-policy priorities?	
B. What information about the existing teacher-education context is needed?	
1. What already exists? (use Instruments 2, 3, and 4)	
2. What existing infrastructure might be re-used for this program? (use Instruments 2, 3, and 4)	
3. In what ways should the program relate to relevant interest groups and other providers? (use Instrument 5)	
4. What is the composition of the budget? (use Instrument 6)	

6 DOCUMENT 6

Comparative Costs of Open and Distance Learning and Conventional Teacher-Education Programs

This extract, from a 1997 World Bank publication, looks at the available data on comparative costs. The main focus is on pre-service and upgrading qualification courses (little work has been done on the comparative costs of CPD by open and distance learning and by conventional provision). The analysis reveals the limits of economies of scale when local support is provided. Further, a supervisory structure also increases the variable costs of the program.

4.1 **4.1** Is distance education cheaper or more expensive than conventional education? The answer to this question is complicated because of the differences between the economic structures of distance and conventional education and because of the poor quality of the data.

Comparative Studies and their Limitations

4.2 **4.2** The pattern of expenditure for distance and conventional education varies with different relationships between fixed and variable costs. In conventional education, staff costs are generally the largest single item in a budget. They tend to vary with the number of students because education is a labor-intensive activity. However, in distance education, teaching can be recorded in advance, reproduced, and distributed to large numbers of students. While significant costs are incurred in developing the teaching materials, the costs of teaching one additional student may be modest. Distance education is thus more capital intensive than conventional education and has higher fixed costs, mainly for the development and production of teaching materials; but has lower variable costs, as fewer face-to-face teaching hours are devoted to each student or group of students. Within distance education, it is therefore possible to expect some economies of scale as the number of students increases. At the same time, supervised teaching and student support generally do not allow these economies of scale. These costs are likely to vary directly with the number of students.

4.3 **4.3** In comparing the costs of conventional and distance education or the consequences of expanding or contracting a program, it is not accurate to

simply take annual expenditure for the two modes of study and divide it by the number of students. (In any one year a significant proportion of the costs of distance education may be to develop teaching materials that are used over a number of years.) Instead, more sophisticated comparisons are needed. Two main approaches are used. One analyzes the cost per hour of study for different modes of education. The other tends to look at the comparative costs of following a course of study or obtaining qualifications through different methods of study.

4.4 **4.4** These make it possible to reach some sound conclusions about how distance education compares with alternatives. At the same time, the conclusions must be qualified as they are based on data of varying quality. One review noted the following inconsistencies that must be reconciled:

- Studies of distance education vary in the extent to which they include capital as well as recurrent costs.
- Institutions vary widely in their organizational structure, choice of teaching media, and preference for employing staff in teaching rather than in administrative or research positions.
- There are often significant differences in social and educational backgrounds of students in conventional and distance-education institutions.
- A number of comparative studies have looked at costs per student without citing graduation rates.

Costs and Outcomes

4.5 **4.5** Six conclusions can be drawn [...] from the cost-effectiveness studies:

4.6 **4.6** First, under certain circumstances distance education is cheaper than conventional education. Where it has been possible to measure effectiveness, distance education has been shown to be more effective and cheaper than conventional education. Distance-education programs can be designed for teachers at a cost of between one-third and two-thirds of conventional programs. To some extent, in Pakistan or Tanzania, for example, this is because they have operated at a large scale and have often achieved high completion rates. Typically these were programs in which successful completion guaranteed more pay. High completion rates narrowed the gap between the cost per student and the cost per graduate.

4.7 **4.7** This finding is consistent with other reported data. In China, for example, where only limited data were available for a comparison between

the cost of the Radio and Television Universities (RTVU) and conventional education, Wei and Tong suggested that the RTVU system was probably "saving a third of the cost of producing a conventional graduate," (1994: 98). Although it used a different methodology from most other studies, the findings are consistent with a review of teacher upgrading through distance education in southern Africa […] (Taylor 1983: 30).

4.8 **4.8** Thus, in a number of the cases where reliable data are available, distance education has achieved the economies of scale that allow the cost per student to fall below that of alternatives.

4.9 **4.9** Second, some distance-education projects were too small to show economies of scale. Three of the projects (Kenya, Nigeria, and Uganda) did not show dramatic economies as compared with conventional programs of teacher education. Indeed, it was probably more costly to produce examination passes through the early distance-education program in Kenya than in conventional schools. Still, the program reached remote teachers who could not be taken out of the classroom for full-time education. There were similar benefits to the recent small-scale project in Uganda. These projects had enrollments between 500 to 3,000. In contrast, the comparative costs of a number of larger distance-education programs have been much more favorable.

4.10 **4.10** Third, one of the major economic advantages of distance education is that it does not demand full-time residence or attendance at a college over a period of years. Thus, a distance-education program is likely to result in a number of different savings in public expenditure, including the cost of providing residential colleges or of paying students a maintenance allowance while they are at college. Students in Ghana, for example, receive a living allowance if they attend university to follow a B.Ed. course but none for a parallel distance-education course. The cost of student residence is reduced when students attend a college for face-to-face sessions only occasionally or for shorter periods than in conventional full-time programs, and colleges are used more intensively.

4.11 **4.11** Fourth, the savings in the cost of residence and the economies of scale made possible through the use of communication media have brought the unit costs of many distance-education programs below those of alternatives. However, there are limits to the economies of scale where there is a significant element of supervised classroom teaching. Extensive support for students or supervision of teaching practice necessarily raises the variable cost of programs. Supervision and support costs rise in

proportion to the number of students so that economies of scale are not possible for this element of the program.

4.12 **4.12** Fifth, the comparison between the costs of distance and conventional education in part reflects the high cost of conventional methods of teacher education. Lockheed and Verspoor, in commenting on the high cost of teacher education, have suggested that if the content of teacher education and secondary education are similar, it would be cheaper to provide that education through secondary schools (1991:96). The Tanzania teacher-training scheme is a striking example of these points; its costs look dramatically high for a low-income country and demonstrate both the high degree of face-to-face supervision provided to the distance-education students and the high cost of conventional teachers' colleges.

4.13 **4.13** Sixth, there are considerable opportunity costs for part-time students. Some of the costs are social: Students spend less time with their children, spouses, or friends. Others are financial: Teachers pursuing a part-time degree in both Kenya and Nigeria reported that their time could have been spent providing paid tuition (Perraton 1993:288). Their opportunity cost was a real one, easily measured in shillings or naira.

4.14 **4.14** The opportunity costs of various modes of study may fall on students or their employers. One of the attractions for employers of the National Technological University in the United States, which trains at workplaces, is that it eliminates the opportunity cost of travel time. In conclusion, a cost-effectiveness analysis of distance education must also consider the value of learners' time and determine who pays that opportunity cost.

4.15 **4.15** In cost, the evidence consistently shows that distance education compares favorably to conventional alternatives for obtaining teacher qualifications. In interpreting the data, it is important to consider the opportunity cost of studying at a distance and the question of who is meeting this cost. Furthermore, while it is legitimate to compare the costs of obtaining the same qualification through different kinds of programs, in a thorough evaluation, one should also be concerned with teachers' post-training performance in the classroom. This question is seldom addressed even with conventional approaches to teacher training and is an area that requires further research.

Source: Perraton, Hilary, and M. Potashnik. 1997. *Teacher Education at a Distance.* Washington, D.C.: the World Bank.

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8 Learner Profile

This profile is designed to help policymakers and planners get a sense of the typical teacher or trainee to be targeted in an open and distance-learning program. The following questions will provide information about the typical learners and their needs. The instrument poses questions in the left-hand column and records brief answers in the right-hand column. At the end of this process, the right-hand column will list the basic characteristics of the typical learner.

The typical learner is:	Notes
1. What is the sex of the learner?	_____
2. On average, how old is the learner?	_____ years old.
3. On average, how many years of education does the learner have?	_____ years of education.
4. Which degree(s) or certificate(s) in education does the learner have?	Holds a _____.
5. Which level does the learner teach at: primary, secondary, or higher education?	Teaches at _____ level.
6. How many hours per week does the learner teach?	Teaches _____ hours per week.
7. How many students does the learner have?	Has _____students.
8. How many grades does the learner teach?	Teaches _____ grades.
9. How many subjects does the learner teach?	Teaches _____subjects.
10. How likely is the learner to have another job within the school (for example, teacher and department head or teacher and principal)?	Is _____ likely to have another job within the school.
11. How likely is the learner to have another job outside the school?	Is _____ likely to have another job outside the school.
12. How likely is the learner to have time-consuming family obligations (for example, be a primary-care provider for children)?	Is _____ likely to have time-consuming family obligations.
13. How much per month or per year does the learner earn from teaching?	_____
14. How much per month or per year does the learner earn from other sources?	_____
15. What types of technology does the learner have at home?	Can access _____ at home.
16. What types of technology does the learner have at school?	Can access _____ at school.
17. How far does the learner live from school?	Lives ____ kilometers from school.
18. How far does the learner live from the nearest university?	Lives ____ kilometers from nearest university.
19. How far does the learner live from the nearest community center?	Lives ____ kilometers from nearest community center.
20. What kind of transportation can the learner access?	Has access to_____.

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9 Design Evaluation

Use this Instrument as a basis for discussion among course developers and evaluators to help determine more specific evaluation criteria.

Design evaluations are conducted during course development, often in the form of a pilot program. The purpose of this evaluation is to ensure that a course works in the way it was designed before participants are enrolled. As with any evaluation, it is important that the purpose and focus of the evaluation are clearly defined at the outset. Establishing clear criteria is the first step in this direction.

Criteria for these evaluations often emerge from the primary challenges involved in ODL, namely attrition, quality, and cost. Criteria generally reflect these basic challenges and can be determined more specifically by course developers and evaluators. The following questions, reflecting the major challenges of ODL, may be examples of some of the questions posed for design evaluation.

✓Challenge 1: Attrition.

- Is the course designed to motivate learners and keep their interest?
- Do the course materials look interesting and attractive? Are they easy to use and understand?
- Are they written in a clear and concise way? Is the tone friendly and encouraging and appropriate to the targeted group of participants?
- Are different examples and alternatives offered to encourage different learning styles and degrees of accessibility to resources and technologies?
- Are there opportunities for participants to engage in school-based activities?

✓Challenge 2: Quality.

- Is the course designed to meet current standards of teaching and content?
- Are the materials durable? Will they last for the duration of a course and for reference afterward?

- Do the instructional methods reflect, support, and encourage current, more active approaches to learning?
- Do the instructional methods allow learners to engage in the materials in ways that are appropriate to their learning?
- Do school-based activities take account of real settings in which learners work, and are they relevant to contemporary classroom practices?

✓Challenge 1: Cost.

- Is the course cost-effective, both for the individual participant and for the program?
- What is the price of the materials for the learner, and how does it compare to the cost of materials in other courses?
- Is the requisite equipment (if any) easily accessible and inexpensive to purchase or use?
- How does the total cost of the course compare to other, similar courses?
- What is the breakdown in costs for the different elements of the course? Are there ways to eliminate or modify some of the more expensive elements?

7

DOCUMENT 7

An Overview of the Management and Administration of Teacher-Education Programs Using Open and Distance Learning

This is an extract from an analysis of the system needs of open and distance-learning programs. It provides an important overview of the administration and infrastructure needs of ODL programs.

Management and Administration of Distance-Education Programs

Effective management is central to good practice in education; however, it is especially vital for distance education. The range of activities involved in distance teaching is broader, and the skills required to develop, produce, and deliver courses are more diverse than those typically found in conventional education.

The provision of distance-education programs coordinates a wide range of activities of varying complexity:

- Writing and editing course texts, study guides, and radio scripts
- Typesetting, printing, and binding course texts and other printed materials
- Producing audiocassettes for radio transmission
- Organizing a network of study centers based on part-time use of external facilities
- Recruiting and managing part-time tutors
- Distributing course texts and other materials to individuals and groups that may be widely dispersed
- Assessing student progress through correspondence-based marking services
- Managing financial activities
- Recruiting and registering students
- Maintaining student records
- Evaluating program effectiveness

Managers' failure to oversee these activities inevitably leads to the following problems:

- Excessive delays in writing and producing course materials
- Inadequate subject content and instructional effectiveness of courses
- Poor integration of the different components of courses (that is, written texts, face-to-face sessions, and radio transmissions)
- Inadequate delivery of course materials to all students or failure to deliver on schedule
- Excessive delays in marking and returning assignments to students
- Inadequate training or monitoring of supervisors and tutors

The authors encountered all these problems in the course of their field studies. These and other failures of poor management inevitably lead to higher dropout rates, lower examination scores, and greater waste of scarce resources.

Management Expertise

Even managing small distance-education systems imposes demands on practitioners. Individuals with the required expertise are seldom readily available, which may explain the number of vacancies in some of the institutions visited.

In the distance-teaching institutions examined in this survey, managers recognized the social complexities of managing distance-education programs. However, only two of the six countries studied had a director with any management training. Thus, managers in distance-teaching institutions and policymakers responsible for staffing should consider the following:

- Revising the current patterns of expenditure to fill key posts
- Introducing measures to avoid turnover of experienced staff
- Reviewing procedures to ensure the early recruitment of replacement staff for vacancies
- Providing staff-development programs, including on-the-job training, to provide a pool of in-house candidates from which staff losses may be replenished

Management Structures

The degree of autonomy that distance-education institutions enjoy varies. The administrative structures within which distance-education systems operate have a significant influence on the program's effectiveness and on the system's management as a whole.

In each of the six countries, governments establish and fund institutions that provide distance education. As already indicated, these institutions maintain a close relationship with the government. Certain advantages accrue. At a minimum, this helps ensure that the distance-education institutions remain responsive to the priorities of policymakers in the ministry. However, a high degree of centralization inevitably imposes constraints on managers, and this has its own disadvantages. As mentioned earlier, in many institutions, managers lack autonomy in the key area of staffing. The central department determines the number of staff employed, their grade, and conditions of appointment.

Program leaders face similar constraints with regard to policy formulation. Thus, managers' limited autonomy may account for the dearth of specific program objectives.

Financial Management

The financial management of activities is an important task in educational management. The task is more important in distance education because the range of items and activities that incur expense is typically wider than for conventional education, where a high proportion of recurrent costs, especially teachers' salaries, are fixed in the short run.

In these six countries, each institution is subject to the allocation process of its parent organization and has little autonomy in financial matters. Few institutions pay directly for goods and services received, and fee arrangements are also centrally controlled. As a result, little financial analysis is available. For example, no figures were available on the cost per student who had enrolled or the cost per student who had passed examinations for any institution.

Education policymakers and relevant ministry officials should consider delegating financial control to senior management in distance-education institutions. They will do so if managers demonstrate efficiency and prudence. One step in this direction would be to allow institutions to set their own fees. Policymakers should also consider allowing distance-

education institutions to retain a substantial part of fees received as a major component of their total income. This would encourage greater attention by managers to the cost efficiency of their operations.

Student Records

All distance-education systems must maintain student records. Typical records include details of the following:

- Students registered
- Fees received
- Course texts and other materials distributed to students
- Assignments returned by students
- Marks awarded by tutors
- Student attendance at face-to-face sessions
- Examination results

Well-maintained and easily accessible records (student progress, dropout rates, and examination results) are a vital source of information for managing programs efficiently and analyzing institutional effectiveness. Such records can also be used to assess the progress of individual students, especially those experiencing learning difficulties. Early identification of such difficulties allows the staff to take timely remedial action and lower student dropout rates.

In most well-developed distance-education systems, records of this kind are now kept in a computer database maintained on a mainframe or mini-computer. The rapid development of hard-disk microcomputer technology and database software has now brought this technology within reach of systems with small and modest resources.

With the exception of Lesotho and Malawi, most records in the six countries studied are kept manually. Some are well kept, but for the most part, records are difficult to access and do not seem to be used systematically to analyze student progress or assess institutional effectiveness.

Distance-education institutions should examine the feasibility of using a microcomputer-based student-record system. A common database format

could have the advantage of providing a basis for comparative analysis of distance-education systems in different countries.

Source: Murphy, Paud, and A. Zhiri. 1992. "Distance Education in Anglophone Africa." Washington, D.C.: The World Bank.

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8 DOCUMENT 8

Teacher Knowledge and the Design of Open and Distance-Learning Courses and Programs

This document indicates five international trends that suggest teacher education should become more school and classroom focused.

In recent years there has been considerable debate about what constitutes teachers' professional knowledge. Much of this has focused on the context of pre-service courses, but increasingly attention is being given to in-service or continuing professional development. The form this takes can vary between linguistic and cultural communities but certain issues and trends now appear to have global resonance. Three are of particular significance to course designers.

The first is the importance afforded to practical activity. There is a movement to making 'teaching practice' or 'school experience' much more central to course structures. Traditionally in teacher education the practical component has existed independent of subject or even pedagogic parts of the course. Today many more courses plan for classroom activity to inform discussions around key pedagogic or subject-focused themes. For example, exploration of the theoretical issues around formative assessment may be derived from a series of activities that the teacher carries out in the classroom. The designers of qualification upgrading courses have a particularly opportunity to exploit the practicum. The trainees are, after all, in their classrooms most of the time and it would seem perverse not to exploit this opportunity.

The University of Fort Hare BEd program described in Document 9 provides a good example as to how this can be done.

A second and related trend is the move from course design as a series of inputs (credits in mathematics or the sociology of education, for example) to a focus on outcomes or competences. South Africa, for example, has reconceptualized teacher education (and the school and vocational curriculum) in this way. Inevitably, therefore, specified outcomes gives strong prominence to classroom performance. Once the outcomes are set out, the task for the course designer is to set out the sort of experience and knowledge that should be provided to achieve such outcomes. Formative assessment, which is important in teaching and learning for young people, becomes equally important at the level of teacher knowledge. Tracking

progress to achieve the outcomes might best be appreciated through a portfolio type of log than summative assessment.

A third trend, which again follows from the first two, is less reliant on examinations and more focused on ongoing assessment (including judgments about practical competence). Formal examinations can only assess a proportion of the competences to be a successful teacher and many argue that this should be reflected in the weight given to different types of assessment.

A fourth trend, particularly in teacher upgrading courses, is the move toward accrediting prior learning (APL). This allows teachers who have acquired considerable classroom knowledge and skills to enter programs at a point that recognizes these skills. Introducing an APL component has implications for course design and structure but it seems entirely appropriate if the associated moves toward more outcome-based assessment are to be effectively introduced. Many are now pointing out the wasteful use of resources and the impact on teacher motivation if all upgrading programs assume every teacher is a novice.

A final trend is to bring subject learning and pedagogy more closely together. In many teacher training courses subject knowledge has traditionally been taught separately. Pedagogy and teaching method courses have likewise been taught generically without reference to subject domains. Increasingly, however, research is pointing to the necessity of bringing the two together. How you teach science, whether at primary or secondary level, depends on an integrated understanding of the science and the most appropriate teaching and learning strategies that can be applied to the science. A teacher, therefore, needs to:

- know about the subject
- know about the subject as it exists in the curriculum being taught
- know about the most effective pedagogic strategies associated with any area of the curriculum.

In teacher education these three dimensions of teacher knowledge are found fused at the practical classroom level. This is a further reason why a strong focus on practical classroom activity most effectively provides a core to course and program design.

Source: written by Bob Moon for this publication.

9 DOCUMENT 9
Description of Fort Hare University, B.Prim.Ed. Program

This describes a qualification-upgrading program that emphasizes school-based improvement. Strong local support is provided through a partnership between the University and the Eastern Cape Education Department. This document includes:

Part A – A description of the program

Part B – A detailed model of the curriculum organization of the program

Parts A and B of **Document 9** can be used by program managers to generate questions about course structure. This document will also be particularly helpful for those developing programs that incorporate a curriculum of school-based activities.

A Part A: A Description of the Program

The program was developed and is offered by the Distance Education Project (DEP), which is based at the All Saints Campus of the University of Fort Hare in Bisho, South Africa. The B.Prim.Ed. Program comprises eight semesters. Each semester comprises two courses, presented through eight *imithamo* (each *umthamo* is a printed booklet of approximately 40 pages) in "bite-size" chunks of approximately 40 hours of learning time.

- Core Education Studies:
  - Learning About Learning (LAL)
  - Helping Learners Learn (HLL)
  - Schools as Learning Communities (SLC)
  - Learning in the World (LIW)
- Learning areas:
  - Literacy
  - Numeracy and Mathematics
  - Natural Sciences
  - Technology

As noted above, each umthamo is a separate booklet, which represents 40 hours of learning time. Of this 40 hours, nine are spent in three, 3-hour Saturday sessions, and the remainder are spent in individual study and classroom application built around a key activity (requiring at least 10 hours to complete).

A typical Saturday morning contact session (of which there are 20 during the two-semester year) involves discussion of three imithamo:

- One being concluded (for example, Umthamo 11, Natural Sciences - What's Happening Here?)
- One being monitored (for example, Umthamo 12, HLL - Creating a Learner-Centered Environment)
- One being introduced (for example, Umthamo 13, MLMMS - Problem-solving and Investigating)

These Saturday morning contact sessions are supported by Abakhwezeli.

Abakhwezeli

A document titled, "Draft Specifications for Part-time Tutors for Core Course Modules" (1997–98) specifies that *Abakhwezeli* need "to explain requirements clearly (not to teach but to *support* learners)." This role is further elaborated in Umthamo I (pp. 2–3) where the story of umthamo and *umkwezeli* is set out.

The terms *tutor* and *mentor* are inadequate and hence the term *umkwezeli* was chosen for its sense of someone whose "job was to keep the fire burning just right so that the food in the pot would cook well." The Abakhwezeli are not supposed to use contact sessions to teach. Rather, their role is to facilitate discussion and explore issues in the printed material. The Abakhwezeli play a key role in motivating teacher-learners in their studies—that is, in "keeping the fire burning."

The majority of Abakhwezeli are teachers or principals from the local area. Some are, or were, college lecturers; and some of these were designated as Educator and School Support Officers (ESSO) (see below) in a secondment arrangement with the Department of Education in 2000.

All Abakhwezeli receive a stipend of only R400 per contact session of three hours.

In practice, Abakhwezeli work considerably more on the B.Prim.Ed. Program than they are paid for as they are not recompensed for time spent in preparation, in additional support, in feedback on assessment of assignments, and on practice portfolio sessions. There are clearly other motivating factors at play. Approximately 11 of these Abakhwezeli are also able to offer school-based support outside of contact sessions in their roles as ESSOs.

Educator and School Support Officers (ESSO)

ESSOs have been approved by the Department of Education from traditional colleges of education. ESSOs are expected to spend 60 percent of their time on Department of Education work (10 percent of that in the office) and 40 percent of their time on Fort Hare's DEP work. In practice, the divisions are blurred because support to individual teacher-learners usually overlaps whole school-development work.

This in turn presents opportunities for further recruitment into the Fort Hare DEP. It seems likely that in 2001 the Department of Education will require Fort Hare to manage the salaries of those seconded ESSOs who are also playing management roles (for example, as center or regional coordinators).

Visits to schools by ESSOs are initiated by Fort Hare DEP teacher-learners and by other teachers who request a visit via the Education Development Officers (EDOs) of their local circuit or district office. Typical areas in which ESSOs provide support are in encouraging parental and community involvement (the topic of an umthamo), implementing Outcome-Based Education (OBE), and teaching technology. The initial workshop tends to involve information-sharing, and subsequent ones offer more activities and sometimes classroom-teaching demonstrations at Fort Hare's All Saints campus.

While curriculum-development and curriculum-support materials remain largely centralized, the learner-support work of Abakhwezeli and ESSOs is increasingly coordinated in a decentralized way through regional coordinators.

Regional Coordinators

The need for regional coordinators became apparent in March 2000. Three positions were created in May 2000: Eastern and Igcuwa; EG Kei; and

Northern. The regional coordinator's role fulfills three broad functions:

- Academic support to Abakhwezeli and teacher-learners
- Administrative support in record keeping and convening a monthly central progress meeting, recruiting, developing plans of action, and negotiating catch-up sessions for lagging groups
- Logistical support to ensure materials are efficiently delivered and that centers have the Abakhwezeli they need to support the teacher-learners enrolled[1]

The Regional Coordinator is the first line of communication for Center Coordinators (see below) and plays a monitoring role in this regard. It is envisaged that this aspect of the program will need to become increasingly autonomous as the program expands.

As indicated above, the link among Regional Coordinators, Abakhwezeli, and Teacher-Learners are the eight Center Coordinators. They are based at Nyathi, Butterworth, Umtata, East London, Bisho, Alice, Bizana, Lusikisiki, Flagstaff, Mt. Frere, Kokstad, Umzimkulu, Maluti, Queenstown, and Sterkspruit. Some Center Coordinators oversee more than one center or double as Regional Coordinators.

Center Coordinators

Center Coordinators play a similar role to Regional Coordinators but on a smaller scale. Key aspects of the role include the following:

- Ensuring that the right imithamo and Abakhwezeli are instated in a timely fashion
- Compiling a monthly report of activities for the Regional Coordinator
- Checking that Abakhwezeli mark key hand-in activities on time, fairly, and accurately
- Ad hoc checking of key non-hand-in activities as well as Abakhwezeli journals

Monitoring performance of Abakhwezeli is intensive for new recruits but becomes intermittent as they gain experience.

The centers themselves comprise classrooms and government offices, which are borrowed for the duration of the contact session.

By using existing facilities, mobilizing community support, and entering into a partnership agreement with the Department of Education, the University of Fort Hare can offer a considerable and varied degree of contact-based support to its teacher-learners without charging prohibitive fees. Currently, the B.Prim.Ed. fee is R3000 per year.

Source:

1. Paired interview with Zoliswa Mafanye (Center Coordinator for East London; Umkhwezeli, ESSO, Materials Developer for Stirling, East London) and Celiwe Ngethu (Regional Coordinator for Gcuwa-lnyathi Region; Center Coordinator, Umkhwezeli, ESSO, Materials Developer for Bisho and Alice) en route to ESSO Presentation in Ncqamakwe, September 19, 2000.
2. Mays, T. 2001. "Innovative Ways to Support Teacher Learners." Open Learning through Distance Education 7(1):16-17.

Part B. Detailed Model of Curriculum Organization of Program

University of Fort Hare, Distance Education Project, Core Education Studies Course, B.Teach Degree

Organizing themes	Learners and Learning	Helping Learners Learn	School as Learning community	Learning in the World
Year 1 Focus	**What is learning**	**Learner-centered classrooms**	**School as learning community**	**Role of education**
Semester 1	Thinking about learning, including learning at home, constructivism	Using group work to aid learning. Group work, activity centers, project work	Concept of school as learning community, characteristics of single grade, multigrade schools, large classes	Role and aim of education: advantages and disadvantages of schooling as one path to education
Semester 2	Exploring teachers' theories about learning including various theorists	The teacher as facilitator and mediator *Profiling the learner*	The self-managing school and community, empowering schools to become self-managing	Understanding education and change in South Africa: pre-colonial, apartheid education and resistance, to date
Year 2 Focus	**Role of language and thinking**	**Outcomes-based education**	**Educational policies**	**Curriculum 2005**
Semester 1	Language and thinking includes metacognition	Understanding change: OBE, teacher as change agent, continuous assessment. ***Evaluating learners' achievements***	Educational policies at school level, classroom curriculum	Curriculum 2005: local imperatives and world trends, purposes of education (work, globalization)

(continued)

Organizing themes	Learners and Learning	Helping Learners Learn	School as Learning community	Learning in the World
Semester 2	Exploring language and thought, different types of speech of learners indicates different ways of thinking	OBE approaches and learning materials. ***Identifying available learning and teaching resources***	Educational Policies at national level. ***Evaluating teaching programs***	Curriculum 2005. Curriculum development, policy and programs.
Year 3 Focus	**Human development**	**Understanding and responding to learners' development**	**Effective management in schools**	**Hidden curriculum**
Semester 1	Physical and cognitive aspects	The teacher as researcher and evaluator. ***Evaluating the effectiveness of teaching***	Effective management: Physical arrangement of classes, classroom preparation, democratizing the classroom, stress, isolation	Hidden curriculum and rules and regulations of teachers and schools.
Semester 2	Social, moral and emotional aspects	Holistic teaching (whole language, theme teaching), all aspects of learners' development ***Action research to improve classroom practice***	Effective management: Scheming, lesson planning, and scheduling	Hidden Curriculum and anti-bias education: race, gender, disability
Year 4 Focus	**Learners and diversity**	**Responding to diversity**	**The school and the community**	**Relevance of education**
Semester 1	How to promote learning, different ways of learning. Catering for individual needs, Independent and peer learning	The teacher as motivator: encouraging positive behaviour of pupils, conflict management	Educational Policies: Community input. Educational resources within the community. ***Identifying available learning and teaching resources***	Cultural context of education, relevance, language and critical literacies
Semester 2	Exploring learning problems and the challenges these present	Using the social context as a resource, using, making, and adapting other resources for learning aids	Contribution of the school to the community. Community and teacher aides Parents-Teachers Association. ***reporting to parents***	***Major research project***

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10 Selecting course materials and technologies

Function in teacher education and development	Strengths	Limitations and requirements
PRINT		
Provides information, concepts and examples in a structured way. Can teach academic subject content, education theory and knowledge about pedagogy. Can link subject knowledge to school curricula and teaching methods. Can combine expert input with teacher- produced materials. Can show teachers' lesson plans, extracts from teachers' diaries and accounts, diagrams of classroom or equipment layout and examples of pupils' work. Can provide transcripts of teacher-pupil interaction for analysis. Can provide guides to action for teachers (e.g. in implementing new curricula or doing action research).	A learning resource in a permanent form, permitting individual or group use. A portable and convenient resource. Copies can be used by more than one teacher. Good for explaining theory and concepts and providing detailed information. Can include a variety of source materials. Can be low cost but scale affects costs. Provides a common standardised resource. If well designed, can combine effectively with other media. Can playa variety of roles, from lead medium to supplementary resource.	Physical distribution of the materials can be slow or difficult in some contexts. Fixed content, not quickly responsive to sudden changes in school curricula or educational legislation or teacher education curricula. Requires relatively lengthy preparation time and team-working by those producing the materials. Cannot show teaching-learning interaction at work in real time in classrooms. As a standardised resource, it may not meet the needs of minority groups or languages, or regional variation. A one-way medium. Interaction is possible with the material, with the school environment applying ideas from the materials, with other teachers in local groups or with tutors.
RADIO		
Provides topical information and current news for teachers. Illustrates text content or addresses educational issues in a lively way, using authentic voices and varied sources (teachers, policy-makers, parents, curriculum developers, education experts). Can raise awareness about education in a wider community audience. Offers a forum for teacher exchanges (teachers' voices). Can reach all or most teachers at the same time to support faster and more widespread information dissemination.	Often widely accessible by teachers Can be responsive to teachers' needs within a short time-scale. Provides immediacy in the materials. Can be very low cost per teacher. Equipment for production can be simple, relatively inexpensive and durable. Use of local radio can increase the relevance of programmes and respond to local needs or languages. Programmes can take a variety of formats and fulfil different purposes: a flexible medium. Can integrate effectively with print.	Ephemeral or impermanent, content lost unless recorded. Scheduled transmission times may be inconvenient. Has a poor and unglamorous image. Needs teamwork and collaboration when integrated with other media (can be difficult to achieve in practice). Often limited by regulatory framework for broadcasting or1ack of enabling policy for educational use. Commercialisation of radio increasing costs for production or transmission. Weak in conveying detailed or conceptually dense material. One way medium.
INTERACTIVE RADIO		
Provides well-structured lessons for teachers and pupils alike in a range of subjects. Compensates for weak teacher-knowledge and can improve it at the same Function in teacher education and development	Has proved effective in several contexts for teaching English as a second language, maths and other subjects. Can reach a mass audience at relatively low cost per learner. Can support teachers in subject knowledge and in demonstrating new teaching methods Structures active learning as part of the lesson Can provide models of lessons	Scheduling may be at inappropriate times. Depends on regular and reliable transmission facilities and broadcasting infrastructure. Cassette tapes can substitute but lose immediacy and need physical distribution. Needs skilled programme designers and structures for teacher support with training for them where interactive radio is new. A one-way medium. Interaction is with materials, with and between children in class and ideally with other teachers.

Function in teacher education and development	Strengths	Limitations and requirements
AUDIO-CASSETTE TAPES		
Provides illustrations through sound. Can give examples of concepts and theory. Can convey information. Can provide discussion in a more natural way than through text. Can provide detailed instructions (e.g. in using a computer or manipulating equipment). Can provide sequences of conversation for close analysis. Can be used as a teachers' 'talking newsletter'. Can provide models of pronunciation. Can act as a 'voice in the ear', to guide teachers through processes (e.g. learning to use a computer or observation tasks)	Offers a permanent resource for individuals or groups. Is relatively portable. Cassette players are often widely accessible by teachers Can be re-played, stopped and started at will by learner. Combines effectively with print, and can extend the use of radio programmes through recording for re-play. Is low cost to develop and duplicate. Can be a more intimate or motivating medium than print, if not presented as a single-voice long lecture. Provides good models in language learning and teaching, and sequences of natural conversation. Can demonstrate communicative approaches in language teaching. Teachers can contribute to tapes or make them. Can be used by tutors to give feedback to students.	Audio-cassettes can deteriorate over time. Sound quality can be poor if a chain of recordings are made or If the equipment is poor. Cassettes need good management (e.g. accurate labelling, storing, mechanisms for circulating among teachers). Can fail to stimulate active learning if used just to deliver lectures. Tape-editing time often under-estimated. Needs skilled integration with print or other media. Content often needs designing differently from radio programmes. A one-way medium.
CD-ROM (COMPACT DISK-READ ONLY MEMORY)		
Provides access to information for teachers in text, graphics, audio and video form. Can provide information on curricula content and teaching methods.	Can store large amounts of information on one disk. Relatively cheap and simple to copy and distribute. Provides random access to content, so a particular segment can be located without having to rewind as in audio-cassettes. Can substitute for lack of access to data- bases where computers lack connection to Internet.	Requires a computer with CD-ROM drive and software to access the disk. Stores less audio material than audio- cassette tapes. More expensive than audio-tapes. Making CD-ROM interactive increases development costs.
TELEVISION		
Can reach a mass audience of teachers and the community. Can raise awareness in the community at large about educational issues and teaching. Shows processes in real-time or slowed down or in close-up (e.g. classroom interaction, language development, mathematical operations). Shows a variety of school and classroom contexts and teachers in action which teachers would not otherwise see, given the isolated nature of teachers' work. Gives teachers comparisons and bench-marks. Can show specialists or experts at work. Provides material as the basis of group discussion.	Can demonstrate real contexts and provide rich visual content. Can capture classroom realities. Can combine a variety of content (e.g. site visits to schools; interviews, dynamic simulations, and examples of teachers' work). Can be combined with other media. Can provide topical content.	High programme development costs and may be high transmission costs. But modest cost per viewer possible on large enough scale. Not always accessible to all teachers. Inadequate technical support at local level sometimes leaves non-functioning equipment. Often inappropriate transmission times for teachers. Sometimes replicates traditional lecture formats which fail to make effective use of the medium's capabilities. One-way medium. May foster passive viewing. Filming in schools requires considerable specialist skills and resources. Filming in studio classrooms is often easier but can lack authenticity.

Function in teacher education and development	Strengths	Limitations and requirements
VIDEO-CASSETTE		
Shows processes in real-time or slowed down. Shows a variety of school and classroom contexts and teachers at work which the viewing teachers would not otherwise see. Can provide separate segments for close analysis relating to different parts of the course materials, not only long sequences. Commercially-produced video-cassettes, for example, on child development or other educational topics, can be 're-purposed' for particular educational uses (segments selected and printed guides produced in relation to them).	Can be relatively low cost, depending on development costs and scale of use. Has some of the strengths of television but can be used in different ways for learning (under the control of the learner who can stop, start and re-play sequences). Can provide material for close observation and analysis, if teacher is guided either on the cassette or in print. Can be used by individual teachers or groups. Can be combined with print. Is a permanent resource. It can: support active learning with good instructional design; demonstrate teachers' beliefs and practices; stimulate discussion; show the realities of teaching in different schools and compensate for teachers' lack of access to other schools; show simulations and role play (e.g. in head teacher training) or children's work.	Requires physical distribution of video-cassettes and access to playback facilities convenient for teachers. Quality (picture and sound) can deteriorate if copies of copies are made, rather than from the master tape. The cassettes need good management (accurate labelling, storing, mechanisms for circulation). Their role needs to be carefully designed to embed them in the course materials or in relation to active learning, if they are not to be a marginal resource. Video may be poor technical quality (poor lighting and sound, one camera recording only the teacher (not the children) and poor educational quality (e.g. presentation of whole 45 minute lesson). Editing time is often underestimated. Needs professional makers to achieve good quality.
VIDEO USE IN MICRO-TEACHING		
Provides a means for student-teachers to observe themselves on recorded video in a teaching situation or simulation, and to get feedback on their performance through viewing the video and discussion with tutor and peers. Provides student-teachers with an opportunity for observing, interpreting and discussing the video material. Provides opportunities for observing and comparing the performance of self with others.	Is effective up to a point, in assisting student-teachers to appraise their own and others' performance and assist the initiation of reflective practice. Provides opportunities for practice and experiment followed by feedback; helps the student-teacher develop specific skills (such as questioning, explaining, managing time-on-task, setting up group-work, using a particular teaching method). A short amount of recording can generate a large amount of discussion and analysis (5-10 minutes of recording can generate at least an hour of analysis and feedback) with a skilled tutor. Gives attention to the individual student-teacher.	Is labour-intensive and small scale, therefore relatively high cost as a form of face-to-face teaching. Effectiveness depends on the quality of the tutor or facilitator, the preparation by tutor and student-teacher, the tutor's skill in facilitation and timing of feedback. Has been criticised as concentrating on isolated, decontextualised and specific teaching skills or competences rather than deep understanding. Requires a room to be set up appropriately as a classroom, with adequate lighting and equipment but can be relatively low-cost to set up. More difficult to do over a distance.
AUDIO TELE-CONFERENCING		
Enables real-time interaction among teachers and educators in different locations. Can bring together teachers, curriculum developers, specialists and policy makers in one event. Can be used for presentations and teaching sessions, discussions, course delivery (in combination with other media) and student support.	Can support development of teachers across large distances enabling contact between groups. Is relatively easy to use (no large amount of technical know-how to master). Can be cost effective but depends on context and comparisons with alternatives. Can provide topical content at short notice more easily than print (has the immediacy (or more) of radio). Can be combined with video-conferencing (one-way video, two-way audio) to reduce video-conferencing costs and to provide interactivity where the infrastructure or budget does not support two-way video-conferencing.	Facilitating group discussion across a number of sites needs high levels of skills and preparation. Requires advance organisation, scheduling and coordination to make the event successful. Special equipment needed so that learners usually have to travel to venue. Costs vary in different countries, but can be cost effective when compared with alternatives. Requires adequate telecommunications infrastructure to function and ensure adequate sound quality. Requires additional materials or two-way graphics for some topics and subjects.

Function in teacher education and development	Strengths	Limitations and requirements
VIDEO-CONFERENCING		
Enables real-time interaction among teachers and educators in different locations. Can bring together teachers, curriculum developers, specialists and policy makers in one event. Can be used for presentations and teaching sessions, discussions, course delivery (in combination with other media) and student support. Can show a variety of visual materials to participants.	Can support development of teachers across large distances, enabling contact between groups. Can provide topical content at short notice more easily than print (has the immediacy (or more) of radio). Can make scarce expertise available widely.	Has high start-up costs; usage levels need to be high enough to recover them. Requires technical support, including at remote sites. Requires students to travel to venue; given the cost of equipping sites, these are likely to be less local than options using different technologies. Where teacher interaction is possible at the local or district level, video-conferencing is likely to be a more expensive option. Where teachers travel long distances to in-service events, the video-conferencing option may be more cost-effective. The added costs of the visual dimension may not provide matching benefits over audio-alone.
COMPUTERS		
Provides access to information on CD-rom and local databases. A means of preparing materials for teaching if consumables are available (e.g. cartridges, paper). Provides computer-based learning materials for teachers and pupils.	Can provide access to large amounts of resources for teachers to select from and use as appropriate in their own contexts or for their own development. Its use helps teachers to develop their own personal computer skills.	The quality of software or learning programmes is sometimes poor. Technical support is needed and may be scarce in rural areas. Access is sometimes restricted for teachers. Training for teachers may be too little, and too narrowly focused on using the computer rather than using it for teaching and learning across the curriculum.
COMPUTER COMMUNICATION		
Enables teachers to participate in larger professional communities, beyond their local ones. Provides access to databases, either on a local area network provided by the education authorities, or the Internet. Enables teachers to follow professional development programmes provided by remote institutions.	Can provide a wide range of multi-media materials, if the infrastructure (and bandwidth) permit. Supports a range of interaction, from formal to informal of varying group size Can archive discussions for later use by other teachers. Allows teachers to participate widely and to exchange experience and materials in peer groups. Provides access to more sources of information and assistance, on topics from the specific ('How do I teach the new curriculum on environmental studies to Grade 3 children?) to more general educational topics.	Problems of access and cost in some countries. Requires an adequate infrastructure (electricity, telecommunications), affordable prices, supportive policy framework and investment of resources. Requires a change in perceptions and practices in teaching and learning (in contrast to common perception that having computer communications will of itself improving the quality of teaching and learning). If lengthy print materials are produced through downloading, this may increase costs per copy over those of centralised print production and shift costs to the teacher, school or district. Requires training for effective use (often neglected). Requires considerable technical support.

Source: Perraton et al. 2002.

10

Document 10

Sample Pages from Fort Hare University, B. Prim. Ed. Program, Teacher-Learner Text, Umthamo, An Introduction to Technology Education, pp. 25–29

These sample pages are taken from the Fort Hare University, B.Prim.Ed. Program **(see Document 9)**.

Use this document to discuss the nature and place of school-based activities within the program.

Unit 5 - A Problem-Solving Project

The next activity is a project. It is the key activity for this umthamo. You and your pupils will work through the phases of a technological process as you solve the problem. This key activity is quite lengthy. We suggest that you break up the activity into sections. Plan to devote several periods, over a number of days, to complete this project.

Your pupils will go through the stages in the technological process by completing the following:

- Investigating a range of different types of holders
- Designing, making, and appraising a holder for pencils

We suggest that you encourage your pupils to work in groups and to carry out this task practically. Many schools do not have the proper equipment for technology education. Therefore, you will need to make some choices when you carry out this activity.

1. Encourage older children to work at home, and then to bring what they have made
   to school.
2. Encourage your pupils to bring whatever materials they can find in the local environment to school. They can then work on the "making" at school.
3. Buy some special tools and materials if your school has the funds. (Remember, however, no special tools or materials are needed.)

The activity begins with a short *story* that provides a context for the project. Then, there is a group *brainstorm* of possible solutions and some discussion. The next step is to *investigate* storage containers and holders. The groups then share ideas and begin to make a *plan* or draw a design. Next, they *make* an object (structure) from available materials. This structure should be able to hold or store pencils safely on a desk in the classroom. Finally, they comment on and compare the structures that they have made (*appraisal*).

Before you start, read through the suggested Key Activity two or three times to help you *plan* what you will do. Then, you can read how this problem-solving activity was conducted by Lukhanyo Konqobe in his multigrade class at Ngwevana. This will give you a picture of how this first technology project will work with your class.

Activity 6 – A Project (Key Activity)

The Story

Mrs. Bolosha is a Grade Two teacher. She has been teaching for 15 years in a village near Matatiele. She likes to set her pupils writing tasks. However, she finds that most of the children lose their pencils. As a result, they find it difficult to finish their work. This is very frustrating.

One day, she discovers that one of her pupils has got a holder for his pencils. It is a peanut butter jar, labeled with his name. Mrs. Bolosha finds it a very good idea and praises the boy. She encourages the rest of the children to do the same.

Her excitement doesn't last long. The jars are made of glass and are easily knocked off the desks. They shatter, and the broken glass is dangerous. Back to the old problem. Try to help Mrs. Bolosha solve her problem, please.

Brainstorming Ideas

Tell or read this story to your pupils. Then set them the task of thinking of designing something to help Mrs. Bolosha. Let them brainstorm ideas in their groups. Then let each group report back with the best idea.

As they report back, note each group's idea on the board. Get the children to explain which materials they plan on using. Discuss the

properties of different materials and different ways to join materials; for instance, cardboard and paper are easy to cut and join. Zinc or tin is hard to cut and join. Zinc will not tear. Wood can be nailed. Plastic can be joined with strong glue.

(This section may take nearly one period.)

Investigating

- First, the children need to examine several different types of holders. This kind of investigation is sometimes called a *survey*. You could ask your children to do this survey after school. You could suggest that they look at objects such as egg boxes, toothbrush holders, cutlery trays, and so on. They can look anywhere, in shops, at home, in offices, and so on. The teacher will need to give the children substantial guidance and encouragement.
- An alternative is to collect a variety of different holders and pictures of holders. Make sure that they are for different purposes and made of different materials. Then get your pupils to examine these holders and to compare them.
- When the children have investigated different holders, give them an opportunity to discuss, compare, and classify what they have seen.

(This section may take up to an entire period.)

Designing and Planning

- Tell your pupils to look carefully at a particular structure (for example, a basket, a Coke-bottle crate, an old cup, a can, a cutlery tray, or an egg box).
- Draw their attention to its strength, capacity, shape, and make-up. Point out that the designer chose the shape and the materials and made the object with a particular purpose in mind. Tell your pupils to comment on the good points of the design. (This will include its suitability for a particular task or job.)
- Remind your pupils of the story about Mrs. Bolosha's problem.
- Then tell your pupils that you want them to discuss and design a strong, safe, and attractive holder for pencils in the classroom. Tell them that you want everyone to think of an idea and to share it with their group members.

- Tell them to think about the materials that they could use to make their structure.
- Encourage the children to sketch while they are sharing their ideas. Tell the children to draw quickly as though they are writing rough notes. Tell them, "Just put your ideas down in the form of a quick clear drawing."

(This section will take another period.)

Making

- When the pupils are satisfied with their designs, they will begin to make their holders. Give them a range of materials: paper, used cardboard boxes, wire, empty cans, bamboo, clay, grass, string, wool, sticky-tape or glue, and scissors. You can encourage your pupils to bring objects easily available in their own environment.
- Tell the children that they can use grass, sticky-tape, glue, string, wool, or wire for joining.
- They must also consider safety and think carefully about their final design. They can then proceed to make their holders.

(This section will take another whole period or longer if they work at home.)

Showing and Appraising

When all the holders have been made, they can be displayed for viewing and discussion. Encourage positive comments. For example:

"This is good because....."
"We like this because...."
"This is a clever way to ...."
"I never thought of...."
"This looks very beautiful because...."
"We wonder if this could be improved by ...."

Later on, on the day that your pupils appraise their pencil holders, record the date and time in your journal, then write, "Technology Education - Key Activity."

Spend some time thinking about what happened when you tried this Key Activity with your learners: What have you learned? What surprised you? What were your pupils' comments?

Record your thoughts in your journal.

You will have a chance to share your experiences, and talk about the structures your learners have made, at the face-to-face session where this umthamo is concluded.

This was an example of a project that you could set your class. It demonstrated the technological process. It was an open-ended task because you asked your pupils to make up their own designs. You were not asking each group to make an identical structure. To carry out this project, your learners had to demonstrate their capabilities. It was, thus, an OBE.

Whenever you set your learners a task or activity, ask yourself if you would be prepared to carry out that activity yourself. Do not ask your children to do something that you aren't prepared to do yourself. We are sure that your pupils would be pleased if you also displayed your pencil holder with the other finished items. Do not worry if yours isn't as good as some of your pupils' holders. Think how proud they will feel!

In later imithamo, we will introduce you to some of the conventions that some technology educators use to set out technology tasks. We will also show you how you can formalize the appraisal aspect of the technology process.

11 DOCUMENT 11
Interactive Radio Instruction

Interactive radio has been used to enhance formal and informal education programs for approximately 30 years. As this document indicates, its prime focus has been on pupil activity. However, it offers significant opportunities for the professional development of teachers. As connectivity and access to appropriate equipment improves, similar programs may be achieved with newer technologies. At present it offers interesting possibilities for incorporation into open and distance-learning CPD programs.

What Makes Interactive Radio Instruction Different from Other Distant Learning Methods?

IRI is the use of lessons in which an audio component—delivered by an "audio teacher" through the radio or audiocassette—and classroom activities, carried out by the learners, are carefully integrated. Within this structure, the audio teacher directs learner activities (exercises, answers to questions, songs, and practical tasks), which take place during carefully timed pauses in the audio script. The classroom teacher acts as a facilitator. IRI is distinct from most other forms of distance education because its primary goal is to improve the quality of education. Unlike many distant-learning efforts that prioritize accessibility, IRI was initiated as a tool for the classroom to counteract low levels of teacher training, poor achievement among learners, and limited resources. While IRI has demonstrated that it can be used to expand access and increase equity in both formal and informal educational settings, it retains an emphasis on quality improvement. IRI's development strategy and methodology require *active learning*, attention to pedagogy, and formative evaluation to be included in the design.

The IRI methodology is also different in that it requires learners to react to questions and exercises through verbal response to radio characters, group work, and physical and intellectual activities *while the program is on the air*. For both the teacher and the student, the lesson becomes an immediate hands-on and experiential guide. Short pauses are provided throughout the lessons after questions and during exercises to ensure that students have the time to adequately think and respond. Interaction is also encouraged within the learning environment between the teacher and learners as they work together to conduct short experiments, do activities,

and solve problems using local resources, imaginative situations, and stories.

The pedagogy of IRI is deliberate: IRI series guide participants through a progression of activities related to measurable learning objectives. Educational content is organized and distributed across lessons so that learning is built upon previous knowledge, and new learners can more easily construct an understanding of the subject being taught. Activities and problems are first demonstrated by radio characters so that the teacher and learners understand the process and the skills and support that may be required. All of these elements are knit together through storylines, music, characterization, and other attributes available through the audio medium.

IRI programs are tailored specifically to the audience and the context in which they will be used. One of the most important aspects of the design, therefore, is the reliance on audience research, participation, and evaluation to ensure that lessons are engaging and relevant and that learners achieve their educational objectives. In the preparation of an IRI series, the format, activities, and pauses in a program change with each new cycle of observation and feedback.

What Is Known about Effectiveness?

The appeal of the IRI approach can partially be attributed to the learning gains for students using IRI programs as compared to students in control groups. While these data are impressive at face value, they are even more impressive when effect sizes (the effectiveness quotient in cost-effectiveness studies) are analyzed.

Source: Bosch, A. *Interactive Radio Instruction: Twenty-three Years of Improving Educational Quality.* Washington, D.C.: the World Bank.

See Also: Improving *Educational Quality Through Interactive Radio Instruction: A Toolkit for Policymakers and Planners.* Washington, D.C.: the World Bank March 2005.

12 DOCUMENT 12
Chile's Learning Network

This document describes how a program in Chile, the Learning Network, allows teachers in remote schools to participate online in an electronic environment focused on professional development.

Telecommunications Infrastructure and Internet Network

Chile's telecommunication infrastructure is one of the more advanced in Latin America. Heavy public and private investment in the sector in the past two decades has given the country a backbone of copper and fiber-optic cables. Since 1991, Chile has had Internet connections that cover a large portion of the country; today it has five separate international connections provided by five companies. Two companies, Reuna and RDC, the oldest Internet service providers, are providing national Internet links. Reuna is different from the other companies in that it is a consortium of state universities, which have joined together to establish an extensive digital backbone that offers speeds of 64 Kilobits; Reuna's international connection is 1.5 Megabytes.

The Enlaces network links primary and secondary schools and other educational institutions through Chile's national computer network. The linkages are made through seven centers located in five zones throughout the country. Each center has the required equipment to service the schools in their zones and use TCP/IP Internet protocols for communications. The majority of communications among schools and institutions is carried out using conventional telephone lines and UUCP (Unix to Unix copy protocols). Node schools that are part of the Enlaces network are able to communicate with each other using e-mail and bulletin boards with standard Internet addresses. Electronic mail messages can be sent to and received from abroad without additional costs by using Chile's university networks as gateways to the Internet.

At present all schools in the Enlaces network have the equipment to be linked to the Internet, but do not have direct lines or service providers, and their connection permits them to receive only text, not graphics or sound. However, this situation is changing rapidly. Enlaces has launched an experiment with the Compania de Telefonos de Chile to connect schools directly to the Internet via fiber-optic cables. Twelve schools in the Temuco

area have already been connected, and others will follow soon. The cost of connections and service will be borne by the company for a year, during which time it will determine a rate structure.[1]

Most schools use telephone lines for network communications. However, some 3,000 or 36 percent of Chile's 8,250 public and subsidized primary schools are in remote areas and do not have telephone service. To provide network access to these schools, Enlaces has begun experimenting with the use of radio. Using packet radios, Ultra High Frequency channels, and the TCP/IP protocol, Enlaces linked up four schools within a 20-kilometer radius, in areas without major geographic obstructions, on the Internet node at the Universidad de la Frontera in Temuco. Enlaces plans to continue experimenting with other communications technologies while increasing the current number of nodes served by packet radios to 20. Meanwhile, Enlaces' engineering team has learned some important lessons: teachers in these remote schools can be taught to use the equipment and to help monitor its use, packet radios are reliable for transmitting electronic mail, and finally, this technology can only be used effectively where there are no geographic obstructions.

Strategy. Enlaces has a gradualist demand-oriented strategy for expanding the network at the primary level. Enlaces' staff has actively promoted the network by visiting schools and meeting with principals and teachers to brief them on the network's educational benefits. However, if schools wished to become part of the network, they had to demonstrate their commitment by applying officially, presenting a proposal as to how the computer network would enhance their educational programs, and agreeing to provide facilities and security for the computer equipment and to cover all recurrent operating and maintenance costs.

The strategy for expanding the network in secondary schools is different from that for primary. Instead of following a gradualist demand-oriented strategy, Enlaces plans to incorporate all l,700 public and government-assisted private secondary schools into the network by the year 2000. To reach this target, EMCEE will annually allocate funds to each regional Secretary of Education to enable a certain number of secondary schools to join the network. Based on selection criteria provided by Enlaces, the regional secretaries would annually select schools on the submission of project proposals. The criteria would be similar to those already used by the program. Enlaces began its secondary school-network program by incorporating 62 schools in 1995. While that in itself was a significant achievement, Enlaces will now have to increase its annual installations by

six times the current rate, if it is to incorporate all secondary schools by 2000.[2] This is well within reach, as the government's contracts with Apple and IBM include not only the purchase of computers and other hardware but also their installation.

Provision and Access to Computer Equipment. Primary schools accepted into the network have been provided computer equipment, software, furniture, and teacher training by Enlaces. The number of computers allocated to each school is determined by enrollments. The Enlaces' standard formula is as follows: a small school (100 students or fewer) would receive three computers, a modem, a CD-ROM player, a dot-matrix printer, and software packages; a medium-size school (100 to 300 students) would be entitled to six computers and the same quantity of peripherals as the small school; and a large school (more than 300 students) nine computers and two CD-ROM players and the same quantity of peripherals allocated to small- and medium-size schools. The computers in each school are linked to a local network by a telephone line connected to a modem. One computer functions as the server to send and receive mail from the center in its zone. School computers are Apple Macintosh and PC compatible with 10BaseT Ethernet cards. For internal communication, schools use Macintosh System 7 or Workgroup for Windows 95, depending upon the platform.

Secondary schools, in contrast, are provided equipment for a multimedia room consisting of 11 computers, a network server, three printers, multimedia accessories such as CD-ROMs, and a wide range of educational software and productivity tools. Planning assumptions are that multimedia rooms would accommodate about 20 students. Those computers already in the schools would also be incorporated into the network, whenever possible.

What do these ratios say about student access to computers? **Table 1** provides some insights by showing what the average maximum weekly computer access would be for each student in different size schools, based on certain assumptions. **Table 1** was constructed according to Enlaces' norms for the provision of computers to different size schools, and it assumes that the equipment would be used throughout the school day.

Table 1 shows that the maximum amount of time that each student alone could have on a computer would be an hour in the smaller schools and only a half hour in the larger ones. However, because two to three students usually work on one computer, the average student-per-computer time

could be as high as 90 minutes in the larger schools and almost three hours in the smaller ones. In fact, schools have adopted different strategies for using computers. Some are limiting access to students on the basis of motivation, interest, and other criteria. Others give all children some access to computers, even if it is only about 25 to 30 minutes a week. Still others, particularly secondary schools, might have other computers so that access is greater than suggested by this table.

Table 1

Average Maximum Weekly Computer Access by School Size (minutes per student)

Computers	50/100 Students	100/300 Students	600 Students	1000 Students
3		108/54 min.		
6			54/36 min.	
9				27 min.
11				33 min.

Assuming that schools are placing two to three students on a computer or limiting access, many students might be getting at least one hour per week and perhaps even more time on computers. If so, what is the most effective use of that time? To its credit, Enlaces has not mandated a response to this question. Enlaces' position is that each school must define its own best use of computers and devise a schedule to make it operational. As a result, there is considerable diversity and experimentation in computer use in network schools as well as interest on the part of teachers to learn new applications.

Software. Despite the limited educational software available in Spanish, Enlaces has provided all of its network primary schools a basic collection of such software. This software consists of titles produced in Chile for educational use and other Spanish titles produced in the United States. One of the most exciting pieces of software used in Chile today is La Plaza. It is distributed to schools by Enlaces and is exemplary for its elegance, simplicity, and facility of use. It is also culturally 100 percent Chilean although its features can be readily adapted to all Latin American countries that have plazas.

La Plaza. La Plaza (the square) is a software program written in C++, which has an attractive and colorful point-and-click interface that permits students and teachers to have easy access to several applications. Originally designed for the Macintosh, it is now also available for use with Windows 3.11 and PC-compatible platforms.

Clicking the "Correo" or Post Office provides access to e-mail, the kiosk stores electronic newspapers and other documents produced and downloaded by teachers and students; the "Museo" or Museum serves as an information center and interface for easy access to software; finally, the "Centro Cultural," or Cultural Center serves as a bulletin-board system. Enlaces has also bought site licenses for some 30 different software titles and has distributed different titles to small groups of schools. It is also providing schools an additional ten multimedia educational applications developed in Chile.

Training and Technical Assistance Strategy. School administrators and teachers are essential to the effective introduction and use of technology in schools. If administrators and teachers actively support technology, attend training courses, and experiment with technology in their teaching programs, there is a very good chance that the schools will achieve significant educational benefits. In Chile, as in most other countries, primary school teachers have given a mixed reception to the introduction of technology in their schools. Their enthusiasm stems from the sense that computers will bring their school into today's world of information and communication and enable them to prepare their students for the future. Their trepidation arises from their own unfamiliarity with computers. They are fearful of the technology and have profound doubts that they will learn to use it effectively. While the majority of teachers are generally willing to try to overcome their fears and learn to use technology effectively, there are some who are unwilling or unable to change.

Enlaces' training strategy is that there is no universal solution for all schools and that training should equip teachers to find their own solutions. It has also attempted to train as many teachers as possible in each school to enable them to incorporate computers into their teaching and avoid repeating the experience of the past ten years when only one "expert" laboratory instructor reigned supreme among the rest of the teachers. Lessons from the experience of Apple Computer Corporation's Apple Classrooms of Tomorrow (ACOT), such as the value of training two coordinators in each school to work as a team and the benefits of involving

teachers in hands-on computer training in the classroom, are also guiding Enlaces' training strategy.

Enlaces has provided in-service training to school administrators and teachers in every school in the network. During the pilot phase it managed to train several hundred administrators and teachers in schools in the southern districts. Most training was organized and conducted by the Enlaces staff in Temuco with the help of consultants. However, training was carried out by university collaborators in Santiago. Enlaces has provided training in two phases. Initial training is obligatory for all schools joining the network and has been held *in situ* after a school has its computers installed. This training has consisted of six weekly, two-hour sessions to help teachers overcome their fears of technology and develop basic computer skills. It also introduced teachers to the various features of La Plaza, emphasizing communications by e-mail, conducting collaborative projects with other schools, and drawing upon the information tools available through the Museum in La Plaza. The second phase of voluntary training consists of specialized month-long modular courses for about eight hours each, which teach software applications such as word processing, spread sheets, and other productivity tools, and their use in teaching.

Enlaces has also trained two teacher coordinators in each school to be leaders in the incorporation of technology. In training two coordinators, rather than one, Enlaces has enabled each to support the other in carrying out their responsibilities. The coordinators provide technical, administrative, and general support to other teachers and the school director. They work with the school director in scheduling the use of computers, securing the necessary inputs and support for projects, and undertaking other in-school activities involving computers. Another key role of the coordinators is to encourage innovation in teaching with computers and to promote the incorporation of computers into the curriculum. The training sessions for coordinators have often been used to help schools reformulate their original projects more effectively.

Notes:

1. Enlaces is already using the web to disseminate information about its activities in Chile and throughout the world. Its website: http://enlaces.unfro.cl also provides information about networks in other Latin American countries and offers links to some of the well-known data banks and network sites in education.

2. This conclusion is based on the fact that Enlaces has five years to reach 1,700 schools and currently has reached 120. At a minimum, it would need to increase installations to 370 per year during the first two years, compared to the present 60 per year.

Source: Potashnik, Michael. 1996. *Chile's Learning Network*. Washington, D.C.: the World Bank: 4–7.

13

DOCUMENT 13

Exploiting the Potential of Electronic Conferencing in Developing Open and Distance Learning Courses for Teachers

This provides a description of how electronic conferencing, using the widely adapted software, FirstClass, has been developed in one open and distance-learning program.

Has anyone perfected the art of fitting in time to listen to readers on a regular basis whilst the rest of the children work on meaningful activities?

I'm being brave and tackling my weakest subject head on by creating a poetry unit. I've chosen the theme, 'Feasting on Poetry.' Any suggestions for multicultural, multiform, cross-the-centuries poems on eating and drinking?

A Year-Seven pupil said to me, 'My dad doesn't want me to learn French.' What do you say to a pupil who is getting active discouragement at home?

Are these snatches of conversations from a student teacher's common room or part of a college seminar? They are in fact both and bypass typical college restrictions of time and space. These are electronic messages from students studying in one of Europe's first and largest teacher-education programs, the Open University's Postgraduate Certificate of Education.

Numerous studies (Schrum 1991; Casey 1992; and Selinger and Parker 1996) have looked at how teacher education is using new technologies. Fewer studies, however, explore the ways that computer-mediated communication challenges our knowledge about the learning process itself. Reflecting on how an electronic community of student teachers and experienced professionals work together illuminates the complex process of becoming a teacher.

An Electronic Community

I am just beginning to talk about exchanging lesson plans and materials with a couple of other students, and it does give one the feeling of belonging to a community … a feeling that one is not alone.

The Open University's 18-month, part-time course that annually trains more than 1,000 graduate teachers from England, Wales, and Northern Ireland is one of a new generation of school-based teacher-education courses (Moon 1995 and Lakerved and Nentwig 1996). As in all the Open University's distance-education courses, a tutor supports student study of multimedia materials with correspondence, telephone, and face-to-face teaching at bimonthly tutorials or day schools.

The program provides every student and tutor with an Apple Macintosh computer, printer, and modem for the duration of the course. The modem enables students to access an extensive and stimulating electronic network controlled by the FirstClass communications program. FirstClass provides user-friendly access to a private mail box, read-only bulletin boards, conferencing, and real-time chats, and the facility to attach and send documents. The system's pervasiveness and its capacity to provide both synchronous and asynchronous communication makes it a fascinating and flexible mode for teaching and for student support that is unexplored in most teacher-education courses.

Students can choose to operate in a variety of environments, some created specifically to support the postgraduate program, others that offer access to university and worldwide conferencing and the Internet. Because experience shows electronic communication to be most effective when it builds on face-to-face contact, tutors encourage their students to participate in a tutor group conference, which has a maximum of 15 students. Here, students discuss study materials, forthcoming assignments, and school experience. Tutors introduce teaching points and raise key issues for discussion between tutorial meetings.

The profile of Open University postgraduate students is distinctive: the majority are adult learners who come from varied employment and life experiences. Occupational backgrounds range from landscape architecture and pharmacy to opera singing and tourist board marketing; educators are well represented. Just 20 percent are under age 30, compared to the national profile of 52 percent of graduate student teachers under 26. All Open University students have deliberately chosen a part-time distance-education course for reasons of work, personal circumstances, or learning preference. Seventy-four percent are women, many of whom are responsible for young children in addition to maintaining full- or part-time work. Others intend to return to paid employment after full-time parenting.

Patterns of use illustrate the FirstClass network's accessibility for students with different schedules. Evening is the period when students are most

active in posting messages, 8 to 10 p.m. being the most popular. Work patterns create informal networking:

> *I've noticed that people tend to log in at particular times. I'm usually a night person, and there are several people I 'meet' regularly. I logged in this morning, and I didn't recognize a single name.*

The Learning Curriculum

Students work in a primary or secondary school near home that has agreed to enter into partnership with the Open University. Participating schools receive resources that enable them to appoint an experienced staffperson as a personal mentor to train the teacher.

Berliner's (1988) notion of progression from novice to expert underpins the design and structure of the course. The student moves from observing and working alongside experienced practitioners for three weeks of school-based work toward solo teaching, which demands six weeks of continuous teaching practice. The program encourages a constant interplay of theory and practice: course materials feed into school activities, which in turn inform students' written assignments and subsequent study.

The Open University's postgraduate program offers a primary course and seven secondary ones: music, English, history, modern language (French), design and technology, science, and mathematics. It also provides electronic conferences for each area, which complement the work of the mentors. Conference titles ("Salle de Francais,""the Design and Technology Workshop," or "English Room") are linguistic extensions of FirstClass's visual, desktop metaphor of a university campus.

Subject conferences vary in style and organization although all have a read-only bulletin board with information about publications and media events as well as debate about new developments in the field. The academic specialist who writes and updates the subject-specific course materials also organizes and moderates each conference. Moderators attempt to develop a philosophy and environment that reflects the best practice of their respective subject departments in U.K. schools. The moderator of the "English Room," for example, aims to acknowledge and build on cultural and linguistic diversity; encourage an enthusiasm for and sharing of literature; and stimulate a critical, questioning approach to media, texts, and ideas in general—all important concerns for English teachers. All conferences provide a nonjudgmental environment. Moderators collect arguments and develop discussion, encourage students

to set agendas, and ensure an exchange of classroom strategies and teaching materials. Like the tutors, they combine the roles of facilitator and teacher.

Many conferences provide folders of teaching ideas and resources. In the "English Room," for example, you can access the complete works of Shakespeare, Shelley's *Frankenstein*, the original *Beowulf*, and *The History of the English Language*. Various satellite conferences are also available, such as debates about the relationship between mathematics and science, or an analysis of media education (an area new to many students) led by a guest lecturer.

Discussion in the specialist areas differs. The comments of those studying French, for example, are most commonly advice on lexical items or explanations on usage; conversation is less frequent, and students tend not to use one another's names. Students of English, on the other hand, initiate controversial debate, are frequent users of anecdotes, and use first names as a matter of course (Leach and Swarbrick 1996).

From Novice Teacher to Expert

Conferencing enables students to have access to a rich variety of people, activities, and resources. Activities have included correspondence among students in schools separated by distance and culture and debates on issues such as gender in the teaching of reading, the use of calculators in mathematics, and teaching with French as the target language.[1] Over a two-month period, discussion in the English conference alone included references to 140 individual texts or authors, ranging from Spenser's sixteenth-century poem, "The Faerie Queen," to contemporary media texts and teenage "point horror" (a series of horror stories). Some students have produced a collaborative online newsletter using graphics and photographs with a cross-curriculum edition on drama. The curriculum encourages analyses of pupil case studies; for example, students recently discussed a bilingual pupil's progress in history class.

Conferencing also provides informal "meeting places" for students working at a distance:

> *Going into a conference at first, it's just a list of messages, yet each has its own atmosphere, its own rules. In the student 'bar,' (sic) we never discuss education, politics, religion, or sports. It's an 18-month-long joke! I couldn't have survived the course without the opportunity for this informal support as well as serious study.*

1 *Target language* is a term used in Britain meaning teaching substantially through the medium of the language being studies—even with beginners.

Students' evaluations illustrate their views on the purposes of FirstClass:

Support in the course itself: "I use FirstClass because it's something related to the course, which I can accomplish in 3–20 minutes (not normally a useful block of study time)."

Study support: "I have drawn some relief from finding that others are in the same boat with regard to overload."

Discussion of school experiences: "I have traded ideas for teaching, and this has stimulated further ideas for me."

Personal relationships: "I like private chat for meeting peers. Sometimes it is hard to have a strong sense of achievement or sense of humor when you're working alone."

Direct teaching: "I find direct contact with people, like the course team, is very helpful. They have been very supportive."

These comments demonstrate the interplay between the private and the professional, the course-related and the personal, and the affective and the cognitive aspects of the learner. The whole person is engaged. This is an evolving learning curriculum that is ongoing and experiential; as, for instance, students debate theory, engage in dialogues about classroom resources and planning, and discuss school problems. As students and teachers share their collective knowledge and experience, we see the creation and transformation of knowledge.

Communities of Practice

Lave and Wenger's (1991) research with adult learners engaged in new learning situations has led them to focus on the social situation in which such learning takes place. They propose the concept of ***legitimate peripheral participation***, a process of gradual involvement in ***communities of practice*** that is at first peripheral then increases in engagement and complexity. To become a full member, they explain, "requires access to a wide range of ongoing activity, to 'old timers,' and to other members of the community; and to information, resources, and opportunities for participation" in communities of practice (p. 26).

From this perspective, becoming a teacher is not a one-person act but rather a process of increasing involvement in teaching communities. Our electronic system offers student teachers studying at a distance the opportunity for ongoing activity in such a community. Although it is a

virtual community, it enables expert practitioners—course writers, tutors, regional staff, managers, and administrators from many educational contexts—to work and relax alongside student teachers on a day-to-day basis throughout the course.

In a recent questionnaire to French and English Open University postgraduate students who are active in their subject conference, students rated "personal contact with other course members" highest as a purpose for using electronic conferencing, followed by "exchange of teaching ideas." Of all FirstClass environments,[2] these students rated the subject conference highest. The questionnaire asked students to rank their reasons for using the subject conferences. Students of English rated "teaching materials and resources" highest, closely followed by "contact with other English specialists." Modern Foreign Language students rated "contact with other linguists" highest, followed by "teaching and learning strategies." The data also revealed that students seek out and value "expert" contributions by course team members and tutors.

[2] For example, Postgraduate Certificate of Education meeting room, regional bulletin board, regional conference, general chat, subject bulletin board, subject conference, tutor conference, and private chat.

These findings illustrate the concept of legitimate peripheral participation. Valuing personal contact most highly, many of the students seek it from the subject community to which they hope to belong. Subject conferences provide the opportunity for sharing between experienced practitioners and aspiring subject specialists. These students have chosen to participate in a subject-specific learning curriculum that is inseparable from social relations. In this sense, subject conferences have the characteristics of communities that enable participants to practice a variety of roles: the novice requesting basic information, the collaborator working alongside others to reflect on challenging school experiences, and the aspiring expert offering solutions to peers.

The concept of legitimate peripheral participation raises critical issues about access and the ways in which any system can exclude newcomers from participation and thus from learning. Electronic conferencing can create "out groups" just as surely as face-to-face contexts do. Specialist language can inhibit novice participation; more experienced, verbally assertive experts can be wearisome. What are the factors that discourage students from participation? What are the issues for non-native speakers of English, those who feel their own culture is disregarded, or those disempowered by specialist discourse? These are critical areas for research.

Questions for the Future

Through the secure environment of their various electronic conferences, novice teachers participate in the concerns of a community—the community of the school and the curriculum area within which they hope to become expert practitioners. Other education programs in the Open University, such as the Ph.D. and the M.A. in educational management, have begun to build on this experience. Undoubtedly, distinctive electronic communities will emerge with their own professional discourse and concerns. This raises important issues for teacher education:

- What range of opportunities should we develop that will best contribute to an effective learning curriculum?
- Can conferencing assist in the process of defining and developing the critical area of "subject knowledge for teaching?"
- How can we build on student experiences to explore and address concerns about access?
- What should the role of moderators be in this process?

Although electronic communities may operate using the metaphors of the real world, they can never replace it. Yet the environment described here provides a secure setting in which novice teachers may practice their emerging skills. It may also provide models for the kind of learning communities our students will establish when they become teachers. In the words of one student:

I leave the course with this vision of an ideal teacher in front of me … the kind with antennae for mischief before it happens, an embracing sense of humor, and a feel for the subject that will enable both the eager pupil and the reluctant.

Source:
Leach, Jenny. 1996. "Teacher Education—Online!" *Educational Leadership 54(3).* Association for Supervision and Curriculum Development, Alexandria, Va.

14 DOCUMENT 14
Missing the Connection? Using ICTs in Education

This document summarizes recent research on how new technologies are being used in developing teacher education.

The spread of information and communication technologies (ICTs) in the last few decades has had a significant impact on work, leisure, culture, and social interaction. But can ICTs make a difference to development and education?

Why and how are ICTs being used in education—are they integrated into the system or simply added extras? How are they being used in teaching and learning? Given the high costs and shrinking resources in education, are ICTs a wise investment? What investment is being made in teachers and other roles necessary to support ICT applications? Are ICTs being used to bridge or widen gaps, or are they creating new ones?

There are typically two sets of responses to these questions. For some, ICTs have widened the divide between the technology-rich north and the technology-poor south. There is indeed a huge overlap between those subsisting on less than $1 a day and those without electricity or telephone connection. Within nation states a gap is emerging between the elite with access to information technology (IT) and the poor without it.

Others argue that ICTs offer developing countries the opportunity to catch up on development. This "leapfrogging" thesis asserts that developing countries can bypass the initial stages of development and it may even be beneficial for developing countries to enter the information age late(r) and so avoid the expensive teething problems of earlier stages.

These two responses reflect the optimistic and pessimistic views about ICTs. The optimistic view stresses the potential benefits of ICTs and argues that they have revolutionized the way people live. The pessimistic view sees the inequity ICTs can create and suggests that they are driven more by advances in technology geared to satisfying the needs of large IT companies than meeting development goals.

However, this debate has been largely rhetorical and lacks detailed consideration on the ways in which ICTs can be used in education in the developing world context. The claims that ICTs provide access to high-quality learning resources, extend scarce teaching resources, and improve efficiency are often taken for granted. While Leach considers how

computers can be used to develop the professional knowledge base of teachers and improve the curricula for learners, it is still unknown what impact ICTs have on teaching and learning performance.

Those in favor of ICTs in education often assume that placing high-grade hardware into schools will change teaching and learning. However, ICTs are merely educational tools which, as Leask points out, require careful planning and attention to human resource development such as teaching skills.

Unfortunately much of the discussion about ICT's has centered on computers only. Myers highlights how 'older' technologies such as radio can be used in education, in this case for raising health awareness in a rural context.

A common theme in this issue of insights education is that ICTs investment for education requires long-term planning that takes account of issues of sustainability and the new developments that ICTs-enhanced education may produce. If, for instance, schools plan to invest in software or content development, the initial and ongoing costs will need to be budgeted for. The significant financial requirements and the dependency on external funding that this entails may well cause developing countries to consider less expensive strategies such as educational television combined with community learning centers or telecenters.

Strategies that allow developing countries to experiment with different kinds of ICTs in different settings may well mean countries develop their own models of best practice. ICT investment should therefore consider the full range of available technologies.

Higher education is one area where arguably, ICTs can be maximized for teaching and learning purposes and where private education institutions can have an advantage. Burkle's Mexican private university case study highlights the teaching and learning changes that computers can produce, but reinforces the argument that using technology well relies on lecturers' motivation and skills. It also raises the issue of the extent to which the private model can be transferred to public-funded institutions.

Using ICTs in education means more than simply teaching learners how to use computers. Technology is a means for improving education and not an end in itself. Thus, ICTs should also be used to promote information literacy—the ability to access, use, and evaluate information from different sources to enhance learning, solve problems, and generate new knowledge. One aim of education should be to help learners become

more independent and effective information seekers and critical users. The common assumption is that as people become familiar and comfortable with ICTs, they will develop an information culture that generates critical thinking and awareness about knowledge production.

The debate over which technologies are appropriate and relevant in education has received little attention in the developing world context. Cawthera examines the use of 'low-cost' ICT solutions rather than the high-grade solutions that are quickly overtaken by advances in technology. However, cost-effective use of computers relies on regular maintenance and part replacement and one question here is whether using recycled second-hand computers can avoid this difficulty.

Many education technology projects in the developing world have failed to realize their goals because parts and technicians were unobtainable locally and staff were not sufficiently trained to make the most of the technology. If investment in ICTs for education is to be sustainable, it needs a proper long-term plan that considers these ongoing costs.

Developing effective partnerships with governments and the private sector is key to reaping the full educational benefits of ICTs. For example, governments might encourage the private sector to play a more socially responsible role by improving infrastructure pricing policy, or negotiate favorable connection rates for educational institutions. Selinger examines the role of the private sector in developing ICT skills, drawing on the experience of the Digital Partnership program and Cisco's Networking Academy Program.

The UK's Imfundo project is committed to developing partnerships between the public and private sectors. Pontefract argues that effective use of ICTs must be tied to the needs of developing countries and challenges the 'one size fits all' approach of many programs. More importantly Imfundo calls upon the private sector to demonstrate visibly its commitment to ICTs for education development.

These articles raise questions of relevancy and support the argument that ICTs need to become part of a broader development strategy rather than an add-on with limited impact. They highlight several crucial hurdles that need to be overcome if the possibilities that ICTs offer are to connect to genuine needs in the education system.

One further cause for concern is the difficulty in obtaining good quality software at a reasonable price. Software is not only expensive initially but even if free in the first instance (as with Microsoft's recent promise

to South Africa's public institutions), the cost of renewing the license prohibits many institutions from using it. Free open source software and alternative operating systems such as Linux are a practical way forward for many developing countries and pose serious challenges to the monopoly of large software firms. One target of private sector involvement should therefore be ensuring that developing countries have access to sustainable software that is tailored to their needs.

Sound and effective policy is the key to making sure that ICTs bring solutions that connect to real problems; otherwise it is likely that initiatives will be small scale and have little impact on the system. This requires collaboration among sectors including education, finance, and telecommunications.

Policymakers will also need to consider:

who will pay for ICTs in schools and how

the role the private sector should play

the appropriate balance between investing in training and infrastructure, such as software and hardware

what kind of software will be used

how schools that obtain ICTs and infrastructure will cover recurrent costs, e.g., Internet access and maintenance.

ICTs need to be used for more than simply reproducing learning by rote. Paying attention to issues such as human resource development and considering the full range of technologies will ensure that ICTs become real tools for education development.

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Source: February 2003 Insights Education Issue #1, id21 Insights

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11 Process Evaluation

Process evaluations usually occur midway through a course or program. The purpose is to make sure that the course is maintaining standards of performance and that it is meeting the needs and expectations of the participants. The process evaluation is designed to help instructors and tutors improve the course while it is being conducted and to simultaneously help course designers improve the course for future learners.

Similar to design evaluation, the criteria for process evaluation emerge from how well the course addresses the challenges of attrition, quality, and cost while it is being conducted. Criteria that might be used for the formative evaluation of a course are usually focused on the main challenges to open and distance learning and may consist of the following:

✓ Challenge 1: Attrition. Is the course holding learners' interest and keeping them motivated?

- Are learners engaged and interacting with the course materials? What materials and activities are most useful to learners?
- Are learners participating in and evaluating school-based activities?
- Are the course requirements flexible enough for learners to accommodate work and family responsibilities?
- Are the learners in a study group, and do they attend tutorials regularly? Have the learners made contact with other professionals in their field?

✓ Challenge 2: Quality. Is the course meeting the learners' or the evaluators' expected standards of teaching and content?

- Is the course of consistently high quality?
- Do learners feel that the course materials are current? Are they learning new concepts and ideas relevant to their work?
- Are the materials, activities, and assignments effective for the learners?
- Are school-based activities relevant to learners' settings? Are they affecting ongoing classroom practices?

✓Challenge 3: Cost. Is the course cost-effective, both for the learners and for the program?

- How many learners are enrolled in the course?
- How many, if any, learners have dropped out of the course?
- Is the cost of the course within the budget? What are the cost over-runs? Are there any areas for savings?

Contents

12 Criteria for Judging the Elements of Open and Distance-Learning Programs in Teacher Education

Twelve aspects of open and distance-learning programs are analyzed on a five-point scale that ranges from poor to excellent. These criteria, initially drawn up as part of the national audit process in South Africa, relate specifically to teacher education. The criteria can be used both in the development of programs and in the evaluation process.

1. Clarity of purpose
2. Compatibility of objectives with overall purpose
3. Student knowledge and experience of schools and teaching are exploited
4. Accuracy of text: up-to-date citation of contemporary research and scholarships
5. Teacher-education-syllabus requirements are fulfilled
6. Course employs students' prior knowledge
7. Text style
8. Material design
9. Audio-visual media (where provided) is appropriately used
10. Assessment strategy
11. Activities as stimuli to student learning
12. Model learning environment created

The following are assessment grades for each of the criteria given above. These grades are designed to provide an objective scale for judgments concerning the standard of any open or distance-learning course.

1. Clarity of Purpose:

1.1 Students are not introduced to the purpose of the course; there is no reflection on purpose in the course content or course conclusion.

1.2 The purpose of the course is stated, although terms are rooted in course content with no reference to student learning or outcomes. Little subsequent reference is made to purpose.

1.3 Students are given a statement of course purpose, covering content and expectations of learning outcomes. There are some subsequent references to this preliminary statement.

1.4 Course content and most expectations of learning outcomes are articulated at the outset of the course, and adequate subsequent references are made to the preliminary statement.

1.5 The purpose of the course is clearly stated at the outset and is comprehensive in enunciating course content and expectations of learning outcomes. Students are drawn back to purpose statements throughout the course and in summary conclusions (an indication of progression to subsequent areas of study).

2. Compatibility of Objectives with Overall Purpose

1.1 No attempt is made to express interim objectives for students either in terms of the material presented or in learning outcomes.

1.2 An attempt is made to set out objectives. This is incomprehensive and insufficiently related to statements of course content and learning outcomes.

2.3 Statement of objective is made but is incomprehensive in covering course content and learning outcomes. Some reference to this is made in interim and summary statements.

2.4 Objectives for the course are clearly articulated in relation to course content and learning outcomes. Reference is made to these objectives throughout the course although they are not fully exploited as a basis for planning future student learning.

2.5 Objectives are explicitly stated. They are clearly related to purpose and cover course content and learning outcomes. These objectives are used in interim summary statements and in overall conclusions as prompts for future student learning.

3. Student Knowledge and Experience of Schools and Teaching Are Exploited

3.1 Little systematic attempt is made to use relevant student knowledge and skills in the teaching context.

3.2 Sporadic references are made to teaching and school context but with no opportunities for students to draw on their own personal knowledge.

3.3 Teaching or school context is used systematically, but students are not called on to draw on their own personal experiences or contexts.

3.4 Teaching or school context is used systematically with some references to students' personal experiences.

3.5 The course, in general, fully exploits teaching and learning contexts, and more specifically, the students' personal school and teaching experiences. Activities and assessment strategies also draw on experiential learning.

4. Accuracy of Text: Up-to-Date Citation of Contemporary Research and Scholarship

4.1 There are several errors of fact and interpretation in text, oversimplification to the point of inaccuracy, and no evidence of recent research or scholarship.

4.2 There are some errors of fact and interpretation with little or no reference to recent research or scholarship.

4.3 There is adequate exposition, few errors of fact or interpretation, and some references to recent research and scholarship.

4.4 There is good synthesis of the subject matter, no errors of fact or interpretation, and adequate references to recent research and scholarship.

5.5 Clear exposition introduces students to the subject as a whole; there is explicit reference to recent research and scholarship and indicators for subsequent follow up.

5. Teacher-Education Syllabus Requirements Are Fulfilled

5.1 The course is weakly related to syllabus requirements. There are large gaps in content and no attempts to develop learning beyond minimum syllabus requirements.

5.2 The course meets syllabus requirements but does so unevenly and often superficially. There is no development beyond minimum requirements.

5.3 The course fully covers syllabus requirements but with few opportunities for interested students to advance beyond the expected average.

4.4 The course imaginatively covers the syllabus and offers some opportunities (unevenly distributed) for individual students to exceed the minimum requirements.

4.5 The course fully covers all aspects of the relevant syllabus and exploits opportunities for syllabus expansion that can extend individual student learning.

6. Course Employs Students' Prior Knowledge

6.1 Course makes no reference to students' prior skills and understanding.

2.2 Course makes no reference to individual students' skills and understanding. Some general reference is made to course assumptions about skills.

2.3 Course makes general assumptions about students' prior skills and understanding. There is some discussion as to how this can be exploited with reference to individual student experience.

2.4 Course articulates assumptions about students' previous skills and understanding with some reference to how this can be exploited with reference to individual students.

2.5 Course fully articulates assumptions about prior skills and experience of the student group as a whole and mediates by fully exploiting individual student experience.

7. Text Style

7.1 The text is impersonal; the language is uneven and poor with recourse to jargon and unexplained technical terms. Text may be sexist.

7.2 The text is impersonal; the language is adequate although sentences may be convoluted and obscure, and not all technical terms are explained. Text may be sexist.

7.3 The text attempts to address the learner directly, but the attempt is uneven as is the consistency of expression and explanation. Text is gender neutral.

7.4 The text directly addresses the learner; the language is concise and informative. There is an attempt to establish an active style of expressing ideas and activities, but this is not systematically sustained throughout the course. The text is gender neutral.

7.5 The text directly addresses the learner in plain and friendly language. Explanations are clear and technical terms are fully defined. Ideas and activities are expressed in an active and engaging way. The author varies voice (conversational, expository, or challenging) and establishes a strong rapport with learner. The text is gender neutral.

8. Material Design

8.1 There is little evidence of planning in design; the text and page layout are cramped. There are few, if any, illustrations or diagrams and, where these do exist, appear disjunctive with the text. Cover design is dull.

8.2 There is some structure in layout design, but pages are still cramped. Diagrams and illustrations are poor with uneven reference to text discussion. Cover design is dull.

8.3 Visual quality of text is good but spacing, illustrations, and diagrams are insufficient to maximize student motivation. Cover design is adequate.

8.4 Visual quality of text is good, and thought is given to spacing, illustrations, and diagrams, and their overall relation to the text. Cover design is good, but there is no use of color.

8.5 Structure of the course is immediately apparent through organized use of headings and icons. Cover, binding, and packaging are visually appealing. There is a purposeful use of color.

9. Audio-Visual Media (where provided) Is Appropriately Used

9.1 Audio-visual material is unrelated to text with poor explanation of how media relates to course objectives. Quality of media is merely "talking text."

9.2 Audio-visual material has limited relation to text, but lacks connection with any student activities. There is some attempt to use media in ways distinct from written text.

9.3 There is adequate use of audio-visual material for the distinct purpose of enhancing in-text student activities. Quality of media is uneven; there is little evidence of creative input by specialist media producers or designers.

9.4 Audio-visual material is fully integrated within course design and with other resources. Some specialist input is evident in program making.

9.5 There is a highly professional production of audio-visual material (comparable to that of an established public broadcasting corporation). The audio-visual media is fully integrated with other resources and course design.

10. Assessment Strategy

10.1 There are no opportunities for continuous, formative, self-evaluative assessment. Summative assessment is limited in range and insufficiently measures learning in relation to course objectives.

10.2 There are few opportunities for continuous, formative, self-evaluative assessment. Summative assessment unevenly measures learning in relation to course objectives.

10.3 There are adequate opportunities for continuous, formative, self-evaluative assessment. Summative procedures measure a substantial proportion of learning as related to course objectives.

10.4 There is good continuous, formative, self-evaluative assessment. Well-designed summative assessment fully measures learning related to course objectives.

10.5 There is a clear structure of continuous, formative, self-evaluative assessment showing appropriate progression into summative assessment design that is imaginatively constructed and fully measures learning related to course objectives.

11. Activities as Stimuli to Student Learning

11.1 There are few in-text activities, and those that exist are poorly related to course content. There is no reference to students' personal knowledge and no school-based activity.

11.2 Activities are set, but these are uniform in character, draw unevenly from the text, and do not exploit the students' personal knowledge of schools and teaching.

11.3 Activities are set that are related to the text. There is some attempt to make reference to and use students' personal, school, and teaching contexts.

11.4 There are well-planned, structured, and varied activities, including appropriate school-based ones that are systematically related to text and make substantive attempt to engage students' personal knowledge of school and teaching context.

11.5 Well-planned, structured, and varied activities include school- and classroom-based activities that develop from the course and students' personal knowledge of school and teaching contexts. Activities are related to overall model of formative assessment and self-evaluation.

12. Model Learning Environment Is Created

12.1 There is a limited range of resources with no personal "in-course" student support and little, if any, exploitation of students' personal experience in the educational context. There is no evidence of evaluation or revision.

12.2 There is a limited range of resources with minimal and uneven "in-course" student support and limited exploitation of students' personal experience in the educational context. There is little evidence of evaluation and revision.

12.3 There is an adequate range of resources supplemented by "in-course" student support, and some exploitation of students' personal experience in an educational context. There is some indication that the course seeks to establish a learning environment congruent with best practice in students' own teaching context. Evaluation systems are in place but are poorly integrated with course revision.

12.4 There is a good range of resources supplemented with well-structured and monitored "in-course" student support. Student knowledge and expertise is fully exploited. Course seeks to establish systematically a learning environment congruent with best practice in students' own teaching context. Evaluation systems are in place that encompass course revision.

INSTRUMENT 12

Fully developed and imaginatively constructed resources are developed within a course framework that provides student support and exploits students' personal experience in an educational context. Course activities and assessment systematically seek to raise standards of student "in-school" achievement. The learning fully mirrors best practice in students' own teaching context. Fully operative quality-assurance and evaluation systems are in place.

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21 Butcher, Neil. 1996. "Teacher Education Offered at a Distance in South Africa: Problems and Possibilities." *Open Praxis* 2: 5–8.

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23 Cantelon, J. E. 1995. "The Evolution and Advantages of Distance Education." In M. H. Rossman and M. E. Rossman, eds., *Facilitating Distance Education* 67(Fall): 3–10, San Francisco: Jossey-Bass Publishers.

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31 Compte, Carmen. 1993. “Telelangues: A New Formula for ‘Close’ Distance Teaching.” *Instruzione a Distanza* 8-9 (August-December): 61–70.

The request of many foreign language teachers for training through video materials has led to the development of a new distance-teaching formula in France. The system was tried out experimentally in 1994 as part of a “close” distance program. It will offer original solutions for three typical problems in training foreign language teachers: preparing them as teachers, preparing them to use video, and giving them this preparation at a distance.

32 Cote. 1997. *Telematics on the WWW. http://www.ex.ac.uk*

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33 Creed, C. 2001a. *Distance Education in the E-9 Countries*. Paris: UNESCO.

This is a report on distance education in a range of European countries.

34 ———. 2001b. *The Use of Distance Education for Teachers*. Cambridge: the International Extension College.

This is a mapping report of international experience in the use of distance learning for teacher education.

35 Cyrs, T. E. 1997. “Competence in Teaching at a Distance.” In T. E. Cyrs, ed., *Teaching and Learning at a Distance: What It Takes to Effectively Design, Deliver, and Evaluate Programs* 71(Fall):15–17. San Francisco: Jossey-Bass Publishers.

An experienced distance educator provides insights into new trends in computer-based teaching and learning in postsecondary education. The author concentrates on the elements that comprise teaching at a distance.

36 Dafgård, L., and P. Becker. 1995. “High School English Course Using Distance Education with Computers and Modem.” *Datorn i Utbildningen* 2: 39–41.

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This report describes how to use visual communication and new media in distance learning.

39 Daniel, John. 1996. *Mega-Universities and Knowledge Media*. London: Routledge-Falmer.

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40 Davis, Nicola, H. McShea, J. McShea, A. Osorio, M. Still, and B. Wright. 1997. "Telematics Applied to the Training of Teachers: A Survey via Video Conferencing across Europe." *European Journal of Teacher Education* 20(1).

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41 Dhanarajan, Gajaraj. 1987. "Offshore Distance Education: A Malaysian Perspective." *Australian Universities Review* 30(2): 39–42.

This article advises that Malaysia must take responsibility for the provision of its own higher education or send its students abroad.

42 Dove, L. A. 1986. *Teachers and Teacher Education in Developing Countries*. London: Croom Helm.

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43 Egan, M. W. 1988. "Rural Pre-service Teacher Preparation Using Two-Way Interactive Television." *Rural Special Education* 9(3): 27-37.

This article presents a comparison between on-campus and distance-education students and suggests that there are no learning performance differences. However, the distance-education students reported insufficient provision for feedback.

44 Egan, M. W., and G. S. Gibb. 1997. "Student-centred Instruction for the Design of Telecourses." In T. E. Cyrs, ed., *Teaching and Learning at a Distance: What It Takes to Effectively Design, Deliver, and Evaluate Programs*. San Francisco: Jossey-Bass Publishers: 33-39.

This paper advocates a student-centered approach to designing distance-education courses for television. It advises instructors adapting a traditional course to distance-learning methodologies.

45 Eisenstadt, Marc. 2000. The *Knowledge Web*. London: Kogan Page Ltd.

This is a review by the Director of the United Kingdom's Open University, Knowledge Media Institute, of the future of new technologies for teaching and learning.

46 European Commission. 1995. *Socrates. A Vademecum*. Brussels.

This document defines ODL and target areas for its application within an outline for SOCRATES-funded projects.

47 Evans, Terry, and D. Nation. 1993. "Educational Technologies: Reforming Open and Distance Education." In T. Evans, and D. Nation, eds., *Reforming Open and Distance Education: Critical Reflections from Practice*. New York: St. Martin's Press: 196–214.

This article suggests an outline for new directions for ODL.

48 Evans, Terry, and D. Nation, eds. 1996. *Opening Education: Policies and Practices from Open and Distance Education*. London: Routledge.

This book contains a collection of papers outlining the different political and cultural contexts of a number of ODL institutions, at all levels, around the world.

49 Farell, J.P., and J. Oliveria. 1993. T*eachers in Developing Countries: Improving Effectiveness and Managing Costs*. World Bank EDI Seminar Series. Washington, D.C.

This document provides an overview of processes and cost issues.

50 Farkas, P., R. Cornell, C. Saar, and J. Armstrong. 1993. *An International Survey of Distance Education and Teacher Training: From Smoke Signals to Satellites*. University of Florida, the Innovation and Development Subcommittee of the International Council for Educational Media, Tampa.

This is one of the few publications that links teacher education and the potential of new communication technologies. Although uneven in quality, the contributions include some useful analyses, including a strong argument for fresh research in the field.

51 Farstad, E. 1991. "Information Science and Didactics: Distance Study of Teacher Education." *Norsk Pedagogisk Tidskrift* 2:99.

The article describes the pedagogical use of computers in teacher education.

52 Fillip, Barbara. 2000. *Distance Education in Africa: New Technologies and New Opportunities*. Japan International Co-operation Agency, U.S. Office, Tokyo.

This is a review of new technologies and connectivity issues.

53 Frankl, J., and B. O'Reilly, eds. 1996. *Lifelong Learning, Open Learning, Distance Learning*. Proceedings of the Fifth European Distance Education Network (EDEN) Conference, Poitiers, France, 8–10 July. EDEN Secretariat, Milton Keynes, U.K.

These proceedings contain many papers, which form a good introduction to the area of ODL in general..

54 Friend, J. 1988. "The Quality of Instructional Messages." *Development Communication Report* 4(61): 10–12.

This brief article describes the importance of quality in the design of distance-education courses.

55 Fulton, K. 1993. "Teaching Matters: The Role of Technology in Education." *Educational Technology Review* Fall/Winter: 5–10.

This article discusses the use of new technologies in teaching but focuses on the need for good teaching to successfully use these in the classroom. Fulton also discusses the education of teachers through distance learning.

56 Garcia, M. L. S. 1993. "Communication Technology in the UNED Teacher Training Program." *Istruzione a Distanza* 8-9 (August–December): 160–72.

The UNED distance-teaching program offers participants real-time instruction that is multipurpose, customized, and interactive. It is based on radio courses broadcast nationally, copies of which are available on audiocassette, as well as text and video. National television broadcasts or videos, introduced for pedagogical reasons, now complete the package.

57 Gardner, J., and H. McNally. 1995. "Supporting School-based Initial Teacher Training with Interactive Video." *British Journal of Educational Technology* 26(1): 30–41.

This paper reports on a project commissioned by the National Council for Educational Technology in the United Kingdom that investigates the potential for interactive video to support students and mentors in school-based initial teacher training. Its results derive from an empirical study in 26 schools currently using interactive video in staff development.

58 George, Rigmar. 1995. "Open and Distance Education as Social Practice." *Distance Education* 16(1): 24–42.

The paper argues that success in open or distance education is dependent on linguistic expertise of the educational context.

59 Gonzalez, P. 1995. *Teaching in Two Environments: A Case Study Comparing Face-to-face and Online Instruction*. Distance Education Symposium 3: Instruction. Selected papers presented at the Third Distance Education Symposium, Pennsylvania State University, University Park.

This case study describes the delivery of a sociology course taught by the same instructor in two environments: face to face and online. Classroom interaction in both environments is discussed in order to explore the relationship between teacher and learners.

60 Göthberg, B. 1993. "Everyone Should Be Allowed to Study on His Own Terms." *Folkhögskolan* 4(19–21): 23-25.

This article describes distance education in a teacher-education program for adult-education colleges.

61 Harasim, L., S. R. Hiltz, et al. 1996. *Learning Networks: A Field Guide to Teaching and Learning Online*. Cambridge: the Massachusetts Institute of Technology Press.

This book examines the use of computer-mediated communication, particularly as it relates to learning networks. It provides a general survey of the field, a comprehensive treatment of the design and implementation of learning networks, and some comments on how learning networks might be applied to education in the future.

62 Harrington, H. L., and R. S. Hathaway. 1994. "Computer Conferencing, Critical Reflection, and Teacher Development." *Teaching and Teacher Education* 10(5): 543–54.

This article studies how conferencing helps develop critical reflection in pre-service teacher education. The results indicate that conferencing does allow students to become more aware of others' views and consequently to reflect on their own.

63 Hawkridge, D. 2000. *Comparing Educational Media*. Knowledge Bank Paper No. 9, International Monetary Fund, Department for International Development. Washington, D.C. *http://www.imfundo.org/Hawkridge/contents.htm*

This paper examines the relative costs of different types of media used to deliver ODL. It also provides a general overview of how text, audio, video, and computer technologies are being used to support distance education in developing countries.

64 Hedberg, J. G., and B. Harper. 1993. "Supporting and Developing Teachers through Telecommunications." *Educational Media International* 30(2): 88–93.

This article details various projects being undertaken in Australia that use multimedia technologies to link information sources ranging from lecturers and libraries to schools and teacher trainees.

65 Henderson, Lyn, and I. Putt. 1993. "The Remote Area Teacher Education Programme (RATEP). Cultural Contextualisation of Distance Education through Interactive Multimedia." *Distance Education* 14(2): 212-31.

This article describes a fully developed open learning system developed to serve teachers in remote island communities. It applies culture to the design and use of new technologies.

66 Inglis, Alistair. 2002. *Delivering Digitally*. London: Kogan Page Ltd.

This work examines the way in which new digital technologies can be incorporated into teaching and learning programs.

67 Inquai, Solomon. 1990. "Refugees and Distance Education." *Convergences* 23(3): 37–48.

This paper defines distance education and its application to the refugee situation. Inquai outlines the history of distance education of teachers of refugees with examples from Somalia and Sudan.

68 Jaeger, Michael. 1995. "Science Teacher Education at a Distance." *American Journal of Distance Education* 9(2): 61–75.

Science teachers in rural schools are often at a disadvantage for receiving continuing education. Telecommunications technology can provide these teachers with access to current information in science education; it also allows teacher educators to model desirable science-teaching strategies. This article reports on a pilot project that used interactive videoconferencing to provide hands-on instruction to science teachers at various rural sites and computer conferencing to link to participants for coursework, networking, and access to resources.

69 James, W. B., and D. L. Gardner. 1995. "Learning Styles: Implications for Distance Learning." in M. H. Rossman and M. E. Rossman, eds., *Facilitating Distance Education* 67 (Fall): 19–31, San Francisco: Jossey-Bass Publishers.

A review of the ways in which ODL programs can be designed to take account of different learner perspectives on the self-study process.

70 Jennings, Z. D. 1990. *Innovation in Tertiary Education in the Caribbean: Distance Teaching in the Faculty of Education of the University of the West Indies*. The Hague: Centre for the Study of Education in Developing Countries.

This paper describes the efforts of the University of the West Indies to present distance teaching in seven countries. The results were disappointing, with lower than expected take up, low student performance, and insufficient student feedback.

71 Joo, J-E. 1999. "Cultural Issues of the Internet in Classrooms." *British Journal of Educational Technology* 30(3): 245–50.

This is an article investigating cultural issues raised by the introduction of Internet applications in classrooms.

72 Jurich, Sonya. 2000. "The End of the Campus University? What the Literature Says about Distance Learning. *TechKnowLogia* (Jan–Feb). *http://www.techknowlogia.org*

This article analyzes the application of new technologies to higher education.

73 Keegan, Desmond. 1998. "The Two Models of Distance Education." *Open Learning November*: 43–47.

This article discusses two models of distance education, group based versus individual based. Highlights include group-based distance education for full-time and part-time students, individualized distance education with and without prepared materials, and distance-education management and research.

74 Kiviniemi, K. 1995. *We Are Doing Our Normal Teaching Work: An Action Research on Teaching Practice which Is Carried Out as Part of a Teacher's Own Work*. University of Jyväskylä, Institute of Chydenius, Finland.

This report describes teaching practice in a teacher-education program that is planned for non-qualified teachers who are already working at schools. The program uses multimedia and distance-learning methods.

75 Kuitunen, H. 1996. *FINISTE Network as a Tool for Innovation in Activating a Wider Spectrum of Approaches to Teaching in Science Education*. University of Helsinki. Department of Teacher Education.

FINISTE was a national branch of UNESCO's International Network for Information in Science and Technology Education (inISTE), whose goal was to develop a broad spectrum of approaches to science teaching and activate teachers nationwide to use it. The diffusion of the developed approaches was organized through spontaneous and guided diffusion strategies. Active members of FINISTE adopted most of the methods developed and were encouraged to spread them further through their own work, using, for example, a distance-learning project and training of the provincial advisers. Each province developed a "critical mass" of administrators, teachers, and teacher educators who could continue spreading the innovation.

76 Kuznetsov, E. I. 1991. "A New Type of Specialist Is Needed." *Soviet Education* 33(3):15-23.

This article emphasizes the need for teacher training in computer use to guide students in the information society.

77 Kynäslahti, Heikki, A. Lauriala, and M. Suortamo. 1995. *Experimenting with POKO: Alternative Class Teacher Education Program as a Developer of Teacher Education*. University of Helsinki. Department of Teacher Education.

This report is a collection of articles on multimedia and distance-education approaches in class teacher education. It describes experiences in the teacher-education program, an alternative route to teaching.

78 Latchem, C., and B. Robinson. 2002. *Teacher Education through Open and Distance Learning*. London/New York. Routledge.

A series of specialist contributions on all aspects of teacher education through open and distance learning.

79 Lombardi, T. 1991. *Satellite Distance Courses: a Collaborative Effort for Meeting Demands for Special Education Teachers*. Paper presented at the Annual Conference of the Council for Exceptional Children, Atlanta.

This paper describes satellite delivery of three courses on special education using satellite delivery.

80 Lang, G. 1997. *Distance Education and Educational Technology: A Survey of Bank Operations in the Education Sector*. Document prepared for the Human Development Department and the Economic Development Institute of the World Bank.

This document provides a wide-ranging review of World Bank activities.

81 Las, I. 1993. "Training Distance Teachers." *Educational Media International* 30(2): 83–87.

This paper outlines a course to develop Computer Mediated Communication by distance teachers.

82 Laurillard, D. 1993. *Rethinking University Teaching: A Framework for the Effective Use of Educational Technology*. London: Routledge.

This is a review of the impact on teaching of a range of new technologies in higher education. Strong on conceptual analysis of the future of universities.

83 Leach, Jenny. 1996. "Teacher Education—On Line!" *Educational Leadership* 54(3).

This is a description of the uses of a computer-conferencing system such as FirstClass in a professional development program for initial teacher training. The different ways the system is configured for subject support, classroom advice, and professional encouragement are all discussed and illustrated.

84 ———. 2000. "Breaking the Silence: The Role of Technology and Community in Leading Professional Development." In R. E. Moon, J. Butcher, and E. Bird, eds., *Leading Professional Development in Education*. London: Routledge-Falmer.

This is an analysis of how web and electronic conferencing environments can contribute to the professional development of teachers. It includes illustrative case-study material.

85 ———. 2002. "Teaching, Learning, and the Digital Age." In R. E. Moon, et al., eds., *Teaching, Learning, and the Curriculum in Secondary Schools*. London: Routledge-Falmer.

This is an overview of the ways in which new forms of ICT can contribute to teaching, learning, and professional development.

86 Leach, Jenny, and Z. Lita. 1996. *Regenerating Teacher Professional Development Through Open and Distance Learning: the Albanian "Kualida" Project*. Proceedings of the Fifth European Distance Education Network (EDEN) Conference, Poitiers, France, 8–10 July. EDEN Secretariat, Milton Keynes, U.K.

This is a description of the use of open and distance-learning techniques to support the requirements of teacher professional practice in Albania. The article describes the acute resource problems and discusses how low-cost materials may be combined with student-support structures to affect change quickly.

87 Leach, Jenny, and R. E. Moon. 1995. *Open and Distance Learning and Teaching in the Education and Training of Albanian Teachers*. Open University, Centre for Research in Teacher Education, Milton Keynes, U.K.

This is an overview of teacher education in Albania and of applying distance-learning systems to the context of in-service training. This work is useful in showing the importance of addressing the social and cultural context in designing programs.

88 ———. 2000. "Changing Paradigms in Teacher Education: A Case Study of Innovation and Change." In A. Scott and J. Freeman-Moir, eds., *Tomorrow's Teachers*. Canterbury University Press.

This is a detailed case study of the development and implementation of an open and distance-learning, pre-service teacher-training program at the United Kingdom's Open University.

89 ———. 2002. *Globalisation, Digital Societies, and School Reform: Realising the Potential of New Technologies to Enhance the Knowledge, Understanding, and Dignity of Teachers*. Open University, Centre for Research in Teacher Education, Milton Keynes, U.K.

This paper was presented to the Second European Conference on Information Technologies in Education and Citizenship: "A Critical Insight," Barcelona, June 26, 2002.

90 Leach, Jenny, R. Patel, A. Peters, T. Power, A. Ahmed, and S. Makalima. 2004. "Deep Impact: A Study of the Use of Hand-held Computers for Teacher Professional Development in Primary Schools in the Global South." *European Journal of Teacher Education* (Spring).

This is a study of the use of state-of-the-art hand-held computers as part of an integrated teacher professional development program.

91 Leach, Jenny, with Ahmed, A., Makalima, S. and Power, T. 2005. "Deep Impact: an investigation of the use of information and communication technologies for teacher education in the global south. Researching the Issues Series. London. DFID.

An account of research carried out in Egypt and South Africa on teachers' use of mobile technology for professional development. The research explores both the nature of the technology and the pedagogical implications for future models of teacher education.

92 Lentell, Helen. 2002. *Policy Issues for Open and Distance Learning*. London: Routledge-Falmer (to be published shortly).

This is an overview of all aspects of open and distance learning from a policy context.

93 Lockwood, Fred. 1992. *Activities in Self-Instructional Texts*. London: Routledge.

This is the standard guide on how to incorporate activities into open and distance-learning texts.

94 ———. 1994. *Materials Production in Open and Distance Learning*. London: Paul Chapman.

This is a selection of articles on established means of developing open and distance-learning programs. It does not include discussion of new interactive technologies.

95 ———. 1995. *Open and Distance Learning Today*. London: Routledge.

This is a collection of papers reporting on the current situations and views in open and distance learning. Information spans a large area from the general through media use and course design to student support and evaluation.

96 Ludlow, B. L. 1994. "A Comparison of Traditional and Distance Education Models." In D. Montgomery, ed., *Proceedings of the Annual National Conference of the American Council on Rural Special Education*. Austin, Texas.

This is a cost and performance comparison among campus-based, field-based, and distance-education programs, which finds that while distance education costs the same per student as campus-educated students, it allows many more teachers to qualify using the same materials.

97 MacKinnon, Allen, B. Walshe, M. Cummings, and U. Velonis. 1995. "An Inventory of Pedagogical Considerations for Interactive Television." *Journal of Distance Education* X (1): 75–94.

This article describes several "multi-point" interactive television conferences that have taken place in British Columbia, Canada. These early experiences are analyzed in terms of pedagogical styles and considerations related to types of interaction among conference participants.

98 Maher, E. 1998. "Does the Delivery Media Impact Student Learning? A Case Study." *Open Learning* (November): 27–32.

This paper presents a case study that looks at factors affecting students' learning and examines differences between two classes that used two different types of media for instruction. The author found that students' learning experiences were similar regardless of the media used.

99 Marker, P., K. MacNamara, and L. Wallace. (2002) *The significance of ICT for reducing povery*. London. DFID.

An exploration of strategic issues around the development of ICTs relevant to debates around ICT and education.

100 Mason, Robin. 1994. *Using Communication Media in Open and Flexible Learning*. London: Routledge.

This is an introductory survey taken of communication media that includes a section on electronic conferencing.

101 McCormick, R. 1992. *Distance Higher Education in China*. Open University, School of Education, Milton Keynes, U.K.

This is a study of distance education that gives significant attention to the role of open and distance learning in teacher education.

102 McKinnon, D. K., and K. Sinclair. 1987. "Teachers Teaching Teachers: A Concerns-based Approach to Computer In-service Education." *Australian Education Researcher* 15(2): 53–70.

This article details the background to the approach of using e-mail for tutor-student communication. The article discusses the various implications of this system.

103 McVay, Maggie. 2002. *The Online Educator*. London: Routledge-Falmer (to be published shortly).

This is a review of how to create online courses.

104 Meisalo, V. E. 1996. *The Integration of Remote Classroom. A Distance Education Project Using Video Conferencing*. University of Helsinki, Department of Teacher Education.

This report considers a Research and Development Project on the integration of remote classrooms for distance education using video-conferencing techniques. The report is related to a case where a tiny village is connected through ISDN link to the Teacher Training School of the University of Helsinki some 1,000 kilometers away. The pedagogical situation in using new technologies is very demanding for the teachers, and a research group at the Department of Teacher Education in the University of Helsinki supports the actions. The report describes the initiation phase of the project and its functions during the first year of action from the viewpoints of the teachers, the pupils, and the parents.

105 Mills, R., and A. Tait. 2002. *Rethinking Learner Support in Distance Education*. London/New York. Routledge.

A review of different models for supporting open and distance learners.

106 Moja, T. 1992. "Teacher Education from Classroom Broadcasts for the New South Africa." *Educational Media International* 29(3): 171–4.

This article discusses the educational problems of South Africa and the possible uses of interactive educational radio for teacher education.

107 Moon, R. E. 1996. "Practical Experience in Teacher Education: Charting A European Agenda." *European Journal of Teacher Education* 19(3): 217–250.

This is an overview of the increased importance accorded to school-based experience in teacher-education programs—the paper argues for greater elaboration of the "community of practice" in the design of teacher-education courses.

108 ———. 1997. "Open Learning and New Technologies in Teacher Education: New Paradigms for Development." *European Journal of Teacher Education* 20(1).

This paper suggests that teacher education is undergoing significant transformation throughout Europe and that new national and international expertise and new methodologies in open and distance education will need to be developed.

109 ———. 1998. "Cost Effectiveness: The Case for New Delivery Strategies in Higher Education." In T. Talati, et al., eds., *Higher Education: A Pathway to Development*. Karachi, Pakistan: the Aga Khan University and Oxford University Press.

This is an overview of the potential of open and distance-learning models with particular reference to teacher education.

110 ———. 2000a. "The Changing Agenda for Professional Development in Education." In R. E. Moon, J. Butcher, and E. Bird, eds., *Leading Professional Development in Education*. London: Routledge-Falmer.

This is a study of trends of the conceptualization of teachers' professional development.

111 ———. 2000b. "The Open Learning Environment: A New Paradigm for International Developments in Teacher Education." In R. E. Moon, M. Ben-Peretz, and S. Brown, eds., *Routledge International Companion to Education*. London: Routledge.

This is an overview of all aspects of contemporary approaches to teacher education provided through open learning programs.

112 ———. 2000c. "Reconceptualising Teacher Education: Open, Flexible, and Moving to Embrace the Digital Age," *Open Praxis*, Vol. 2.

This is an analysis of the inevitability of teacher education embracing open and distance learning and new interactive technologies in the twenty-first century.

113 Moon, R. E., and A. Shelton Mayes. 1995. "Integrating Values into the Assessment of Teachers in Initial Teacher Education and Training." In L. T. Kerry and A. Shelton Mayes, eds., *Issues in Mentoring*. London: Routledge.

This chapter discusses the advantages of a competence model for assessment of initial teacher training. It also indicates the need to consider wider issues, such as which professional qualities are essential to a successful teacher and how to assess those qualities.

114 Moonen, J. 1994. *Communication and Information Technologies as Change Agents*. Proceedings of the workshop, Teacher Education and Information Technologies: Issues and Experiences for Countries in Transition, Enschede, the Netherlands.

This publication describes the need for teacher education to be focused on the consequences of ICT for training and working of individuals. The teaching profession is shifting emphasis from delivering information to creating learning environments.

115 ———. 1996. *The Efficiency of Telelearning*. *http://www.to.utwente.nl/ism/publicat/seoul96g.htm*

This online publication deals with the putative efficiency of telelearning. The analysis shows that there are no precise indications about the effects nor about the costs of telelearning, and therefore none about its efficiency. Effects are undetermined and costs are variable. Telelearning is expected to create (at least) the same kind of output as traditional teaching, although telelearning certainly can create richer opportunities and environments.

116 Moore, G. R. 1991 "Computer to Computer: Mentoring Possibilities." *Educational Leadership* 49(3): 40.

This paper describes the use of e-mail to provide mentoring for students.

117 Moore, M. G. 1995. "American Distance Education: A Short Literature Review." In F. Lockwood, ed., *Open and Distance Learning Today*. New York: Routledge: 32–41.

The author presents a synopsis of current research in distance education in the United States. Topics include delivery of distance education in the United States, theoretical models, and policy research. An extensive list of references is also included.

118 Moore, M. G., and G. Kearsley. 1996. *Distance Education: A Systems View*. Belmont, Cal.: Wadsworth Publishing Company.

This book provides a general overview of distance education, particularly as it relates to the development and implementation of large-scale projects. It includes sections on the development of learning materials and assessment of both students and programs.

119 Moran, L., and I. Mugridge. 1993. "Collaboration in Distance Education: An Introduction." In L. Moran and I. Mugridge, eds., *Collaboration in Distance Education: International Case Studies*. New York: Routledge: 1–11.

This chapter provides an overview of the book that includes case studies of collaboration in distance education from several countries.

120 Morgan, Chris, and M. O'Reilly. 1999. *Assessing Open and Distance Learners*. London: Kogan Page Ltd.

Although not specifically related to teacher education, the book covers a range of established procedures for open and distance learning.

121 Moses, K. D. 2004. "Educational computer system maintenance and support: they cost more than you think." In Perraton, H., and H. Lentell. (eds) *Policy for Open and Distance Learning*. London/New York. Routledge.

An overview of issues surrounding the costs of implementing ICT into programs of open and distance learning.

122 Murphy, K. L. 1995. "The Potential for Mindful Teaching at a Distance: A Dual Challenge in Educating Teachers." *International Journal of Educational Telecommunications* 1(2/3): 167–83.

This article begins with examples of mindlessness and mindfulness in daily life, and it proceeds to describe the negative effects of mindlessness in both traditional and distance education. Mindfulness in distance education is then described in terms of a dual challenge for teachers: how to teach at a distance, and how to teach teachers to teach at a distance.

123 Murphy, K. L., S. Cathcart, et al. 1997. "Integrating Distance Education Technologies in a Graduate Course." *TechTrends* (January/February): 24–28.

This is a case study of the use of open and distance learning.

124 Murphy, Paud, and A. Zhiri. 1992. *Distance Education in Anglophone Africa*. Washington, D.C.: the World Bank.

This is a collection of papers summarizing open and distance-learning experience in several African countries. Case-study information from secondary-education and teacher-training programs is included.

125 OECD (Organisation for Economic Co-operation and Development). 1992. *Education and New Information Technologies. Teacher Training and Research: A Survey of Co-operative Projects between Universities and Schools*. Paris.

This is a discussion of the results of a survey on teacher education, research, and evaluation in information technology and communication conducted between schools and universities.

126 Papadoudi, H. 1993. "Distance Teaching and Teacher Training in France." *Istruzione a Distanza* 8–9 (August–December): 71–84.

New legislation in 1989 dictated that all future teachers must hold a university degree and must undergo two years' training at one of the IUMF (Instituts Universitaires de Formation des Maîtres) teacher-training institutions. This change has come about at a time of rapid economic, social, cultural, and technological evolution requiring new forms of initial and continuous education. The IUMF has responded to this challenge by implementing alternative forms of education including distance teaching. A number of initiatives are described.

127 Pereira, M. O. 1993. "Attitudes to Study in the Distance Teaching Context." Universidade Aberta, Lisbon.

The author analyzes the attitudes of students doing initial teacher training at Universidade Aberta, Portugal, regarding distance education, content organization, relevance of themes, resources, learning activities, and assessment. The majority of students express a favorable attitude to distance education and the course, in particular.

128 Perraton, Hilary. 2000. *Open and Distance Learning in the Developing World*. London: Routledge.

This is an overview of contemporary issues in open and distance learning, including a chapter on teacher education.

129 Perraton, Hilary, and C. Creed. 1999. *Distance Education Practice: Training and Rewarding Authors*. DFID Education Research Series, No. 33, London.

This work focuses on the issue of training authors for distance-education materials.

130 Perraton, Hilary, and M. Potashnik. 1997. *Teacher Education at a Distance*. Washington, D.C.: the World Bank.

This is an overview of the main issues in developing open and distance-learning strategies at the policy level.

131 ———. 2002b. *International Case Studies of Teacher Education at a Distance*. Paris: UNESCO.

These are case studies focusing on Brazil, Burkina Faso, Chile, China, India, Mongolia, Nigeria, South Africa, and the United Kingdom.

132 Perraton, Hilary, B. Robinson, and C. Creed. 2002a. *Teacher Education Guidelines: Technology Curriculum, Evaluation, Cost*. Paris: UNESCO.

This is a set of guidelines for middle managers in education ministries and teacher-education institutions intending to expand teacher education through ODL.

133 Phillips, M., P., Scott, et al. 1998. "Towards a Strategy for the Use of New Technology in Student Guidance and Support." *Open Learning* (June): 52-58.

This article presents two examples of experiments in the integration of interactive multimedia into courses offered through the Open University (the United Kingdom).

134 Piipari, Martti. 1996. "Teachers' Readiness for Modern Information Technology." In H. Niemi, and K. Tirri, eds., *Effectiveness of Teacher Education. New Challenges and Approaches to Evaluation*. University of Tampere, Hämeenlinna, Finland.

The article gives a theoretical framework of basic skills for teachers when they use modern information and communication technology as a part of their work in open learning environments.

135 Pincas, A. 1995. "Why Computer Conferencing May Help Students More Than Face-to-Face Teaching." In A. Tait, ed., *Putting the Student First: Learner-centred Approaches in Open and Distance Learning*. Collected conference papers of the Sixth Cambridge International Conference on Open and Distance Learning, U.K.

This paper supports the conviction that asynchronous computer conferencing enables a learner-centered approach to teaching in higher education and suggests two choices in organizing courses to benefit from it.

136 Platten, M. R., and B. O. Barker. 1987. *Texas Tech University's Model of Teaching over Satellite*. Texas Technical University, Houston.

This is a description of how a private satellite system was used in a pilot study investigating resource sharing among institutions.

137 Plomp, T., A. ten Brummelhuis, and R. Rapmund, eds. 1996. *Teaching and Learning for the Future*. SDU / DOP, the Hague.

The COMMITT, Committee On Multimedia in Teacher Training is an advisory committee established by the Dutch Minister of Education. The report recommends the redesign of the learning process of the future and the role of ICT to support that learning process with a focus on teacher training. It presents a plan of action and a strategic framework to support efforts of teacher-training institutes to develop their own plans for enhancing the teaching and learning processes as well as its outcomes through the application of ICT.

138 Potashnik, Michael. 1996. *Chile's Learning Network*. Washington, D.C.: the World Bank

This is a summary of developments in Chile, one of the most advanced Latin American countries in terms of telecommunications infrastructure. It is informative on the early stage development of the Enlaces Program, linking schools and teachers through a computer network.

139 Prain, Vaughan, and T. Booth. 1993. "Using Interactive Television to Deliver Professional Development Programmes in Rural Australia." *Education in Rural Australia* 3(2): 5–10.

This article presents the results of a survey on the experiences of both presenters and participants in interactive television for professional purposes. The negative effects of poor training and awareness of how to encourage and manage the interactivity are highlighted.

140 Purushotaman, S. A. 1993. *Teacher Oriented Televised Education (TOTE) in Distance Learning*. Proceedings of the AAOO VIII Conference, Indira Gandhi National Open University, New Delhi.

This is a discussion of the development and management of Teacher Oriented Television Education (TOTE) and its effectiveness in the Indian context.

141 Race, P. 1989. *The Open Learning Handbook: Selecting, Designing, and Supporting Open Learning Materials*. London: Kogan Page, Ltd.

This book provides an extensive guide to the selection, design, and support needed to create effective distance-learning materials. While the author primarily focuses on materials, he also provides some general background on open learning and open learning programs.

142 Reddy, S. 1986. "Educational Radio: Directions in the Pacific." *Media in Educational Development* 19(1): 34–7.

This article gives a personal view of the use of radio as an educational medium in some island nations of the South Pacific with their distinctive cultures. It also outlines the costs, personnel, and facilities involved in its use.

143 Richier, André, A. Dumont, C. Hermant, and M. Riché. 1997. "Education and Multimedia: The Actions of the European Union." *European Journal of Teacher Education* 20(1).

This paper sets out the findings and recommendations of a task force that was set up by the European Commission to investigate the "Educational Multimedia." It illustrates some of the strategic planning that has taken place across EU member states to coordinate work on new educational technologies to enhance teaching and learning.

144 Robinson, B. 1997. "Distance Education for Primary Teacher Training in Development Countries." In J. Lynch, et al., eds. *Innovations in Delivering Primary Education, Vol. III of Education and Development: Tradition and Innovation*. London: Chassell.

The focus of this paper is on primary teacher training.

145 Robson, J., P. Routcliffe, and R. Fitzgerald. 1992. "Remote Schooling and Information Technology." *Education in Rural Australia* 2(2): 33–6.

This report gives information on the use of different technologies in the various states of Australia.

146 Rowntree, Derek. 1992. *Exploring Open and Distance Learning*. London: Kogan Page Ltd.

This is a useful and accessible outline of all aspects of open and distance learning from designing learning packages to tutor support and economic considerations.

147 Rowntree, Derek. 1998. "Assessing the Quality of Materials-Based Teaching and Learning." *Open Learning* (June): 12–22.

This article examines the issue of quality assessment for distance education. The author suggests that distance-education methodologies cannot be judged in the same way as conventional, face-to-face teaching. He presents and discusses 20 questions for program evaluation.

148 Rumble, G. 1992. *The Management of Distance Learning Systems*. Paris: UNESCO/IIEP.

This is a classic text on an overview of systems management in ODL.

149 ———. 1997. *The Costs and Economics of Open and Distance Learning*. London: Kogan Page Ltd.

This is a review of cost analysis in open and distance-learning programs.

150 Rust, V. D., and P. Dalin. 1990. *Teachers and Teaching in the Developing World*. New York: Garland.

This work presents a general overview of the context of teachers in developing countries.

151 Russel, T. L. 1993. *Which Television Medium is Best for Distance Learning? The Rationale Being*. In G. Davies and B. Samways, eds., Teleteaching: Proceedings of the IFIPTC3 Third Teleteaching Conference, Trondheim, Norway.

This paper discusses the perceptions of television and educational television and cites the example of VideoClass system as a low-cost good practice leading to good learning outcomes and teacher and student satisfaction.

152 Sahide, A., et al. 1986. *The Distance Learning Program at Ikipujung Pandang, Indonesia*. Paper presented at the Annual Conference of the National Rural and Small Schools Consortium, Birmingham, Wash.

This paper discusses in-service teacher education at a distance, based on text-based programs operated at several sites and supported by subject tutors. The author identifies student-learning difficulties, especially regarding self-directed learning, as a weakness of the programs.

153 SAIDE. 1995. *Teacher Education Offered at a Distance*. South African Institute for Distance Education, Johannesburg.

This is a national report prepared as part of an audit of teacher education across the country. The report contains a general discussion of issues associated with the future of open learning.

154 Saint, William. 2000. "Tertiary Distance Education and Technology in Sub-Saharan Africa." *Education and Technology Technical Notes Services* 5(1), the World Bank. h*ttp://www.worldbank.org/education/digitaldivide*

This is a review of a range of issues affecting development of higher education in Sub-Saharan Africa.

155 Salmon, G. 2000. *E-moderating: The Key to Teachers and Learning Online*. London, Kogan Page Ltd.

This is one of the first texts to look at the experience of using electronic conferencing in open and distance-learning programs.

156 Scriven, B. A. 1991. "Distance Education and Open Learning: Implications for Professional Development and Retraining." *Distance Education* 12(2): 297–305.

This article provides a basic explanation of open and distance learning while applying ODL to the context of in-service teacher education as one of several professions seeking to provide ongoing personal and professional development.

157 Selinger, M. 1997. "Distance Learning, Electronic Communications, and Beginning Teachers." *European Journal of Teacher Education* 20(1).

In this paper the use of computer conferencing, an integral component of the U.K. Open University's PGCE course, is described and evaluated, and ways in which electronic communications can be developed into an effective medium for enhancing new teachers' competence and confidence are discussed.

158 Sewart, David, ed. 1995. *One World, Many Voices: Quality in Open and Distance Learning*. Selected papers from the 17th World Conference of the International Council for Distance Education, Birmingham, U.K., 26–30 June. Open University, Milton Keynes, U.K.

This is a collection of papers that makes a thorough introduction to this ODL.

159 Sherry, A. C., C. P. Fulford, et al. 1998. "Assessing Distance Learners; Satisfaction with Instruction: A Quantitative and a Qualitative Measure." *The American Journal of Distance Education* 12(3): 4–28.

This article describes two approaches to student-based evaluations that were examined for their potential application to distance education and assesses some aspects of the instructional climate in distance education.

160 Simonson, M. 1997. "Evaluating Teaching and Learning at a Distance." In T. E. Cyrs, ed., *Teaching and Learning at a Distance: What It Takes to Effectively Design, Deliver, and Evaluate Programs* 71(Fall). San Francisco, Jossey-Bass Publishers: 87–94.

This paper discusses some issues affecting the evaluation of teaching and learning in distance-education programs. It is aimed particularly at post-secondary educators who are designing their classes to include a distance-education component.

161 Smith, R., and M. MacIndoe. 1991. "Education and the Interactive Multimedia Technologies: The Remote Area Teacher Education Project (RATEP)." *Unicorn* 17(3): 139–45.

This article describes the training, knowledge, funding, and technologies necessary to create quality multimedia software for distance education.

162 Soetaert, Ronald, and L. Top, eds. 1996. *Een Beeld van Belezenheid*. Sdu-Uitgevers, the Hague.

This book deals with the problem of cultural literacy in a post-modern society (for an English translation see the website: http://dewey.rug.ac.be).

163 Soetaert, Ronald, L. Top, and G. Van Belle. 1995. "Creating a New Borderland on the Screen." *Educational Media International*. 32(2): 62–8.

This article deals with the outcome of an educational research project conducted at the University of Ghent's Department of Teacher Training. The authors created new teaching materials for literature from a European perspective and concluded that the opening up of the traditional (national) literary canon should lead to a global revision of the literature course design and a revision of teaching, in general. In such a revision the multimedia hypertext structure should play a key role (see http://dewey.rug.ac.be).

164 Soetaert, R., and G. Van Belle. 1996. "Schermen met Geletterdheid." In R. Soetaert, and L. Top, eds., *Een Beeld van Belezenheid*. Sdu-Uitgevers, the Hague.

In their article, the authors focus on the cultural and educational implications of hypermedia (for an English translation see the website: http://dewey.rug.ac.be).

165 Somekh, B., and N. E. Davis, eds. 1997. *Using IT Effectively in Teaching and Learning: Studies in In-service and Pre-service Teacher Education*. London: Routledge.

This is a collection of papers reporting experiences of and recommendations for the use of ICTs in teacher education.

166 Sparks, J. 1990. *Project NETWORC Final Report*. Nevada State Department of Human Resources, Carson City.

This report describes a project in which rural classes were linked through audio-conferencing, television, and fax. Student evaluation was positive, and there was a cost saving of over 50 percent per student.

167 Spitzer, D. R. 1998. "Rediscovering the Social Context of Distance Learning." *Educational Technology* 38(2): 52-56.

This article argues that focus on the technical aspects of distance learning contributes to those methods being used less frequently. The author emphasizes the technical and human dimensions of distance learning, including resistance to change, user perspective, inertia, and entropy.

168 Stevenson, K., and P. Sander. 1998. "How Do Open University Students Expect to Be Taught at Tutorials?" *Open Learning* (June): 42–46.

This article analyzes students' expectations about various aspects of their tutoring at an Open University (United Kingdom) course. The study focuses on students' attitudes toward teaching methods and their perceptions of a good lecturer. It concludes that tutoring can be improved through tutors' reflections on content and delivery style based on student feedback.

169 Stewart, R. D. 1995. "Distance Learning Technology." In M. H. Rossman, and M. E. Rossman, eds., *Facilitating Distance Education* 67(Fall), San Francisco: Jossey-Bass Publishers: 11–18.

This paper is an overview of technologies used to facilitate distance education. The author discusses a range of technologies but focuses primarily on computer-based options.

170 Suonperä, M. E. 1993. *Learning Environment Using Telecommunication. Intermediate Report of the Cooperative Project PEDATEL with Tele and Higher Education Institution of Vocational Teacher Education*. Higher Education Institution of Vocational Teacher Education, Hämeenlinna, Finland.

The report describes open learning environments in vocational teacher education and new applications of telecommunication.

171 Taylor, D. C. 1983. "The Cost Effectiveness of Teacher Upgrading by Distance Teaching in Southern Africa." *International Journal of Educational Development* 3(1): 461–82.

An analysis of the cost implications of using distance education for teacher qualification upgrading in a range of Southern African countries.

172 Tella, Seppo. 1995. *Virtual School in a Networked Learning Environment*. University of Helsinki. Department of Teacher Education, OLE Publications.

The publication describes the idea and experiences of virtual school.

173 Thomas, E., ed. 2002. *World Yearbook of Education 2002: Teacher Education: Dilemmas and Prospects*. London: Kogan Page Ltd.

This report raises some key issues for teacher-education planners.

174 Thorpe, M., ed. 1993. *Culture and Processes of Adult Learning: A Reader*. New York: Routledge.

This is a compilation of papers on areas concerned with adult education. It is grouped into three sections: power, purpose, and outcomes; adulthood and learning; and learners' experience and facilitating learning.

175 Torres, R. M. 1996. "Without the Reform of Teacher Education There Will Be No Reform of Education." *Prospects* 26(3): 447–67.

This article explores issues of reform in teacher education.

176 Van-Horn, C., and A. Doris. 1993. *Technology and the Future of Education*. Paper presented at the National Conference of the CSU Institute for Teaching and Learning, Quality, Creativity, and Research. San Jose, Ca.

This paper discusses the need for educators to adapt technologies, such as television, to education by providing interactivity and supplementary materials.

177 Van Schie, Joop. 1997. "A World-Wide-Web Survey on the Use of Information and Communication Technology (ICT) in Education." *European Journal of Teacher Education* 20(1).

This paper presents an overview of the results of a survey (the Aggiornamento survey) on the use of information and communication technologies in education, initially focusing on vocational education.

178 Van Zyl, John. 1992. "Radio and TV Education: The Case for and against Technology." In R. McGregor, and A. McGregor, eds., *McGregor's Education Alternatives*. Cape Town: Kenwyn, Juta, and Co. Ltd. 435–53.

This paper presents an overview of the potential for radio and television education in South Africa.

179 Veen, W., B. Collis, P. Devries, and F. Vogelgang. 1994. *Telematics in Education: The European Case*, De Lier, the Netherlands.

This is an overview of potential telematics applications covering a range of European contexts.

180 Veen, W., F. Korthagen, D. Lockhorst, W. Admiraal, and Th. Wubbels. 1996. "Partnership and Cooperation at Two Levels: Tele-guidance in Teacher Education." In Proceedings of the Annual Conference of the ATEE, Glasgow.

This article describes the experiences of IVLOS, Institute of Education, implementing tele-guidance in school-based teaching practice. It provides recent insights into the benefits and limitations of providing a structured tele-guidance approach to student teachers using telecommunications at home. Collaboration among peer student teachers appears to be critical and leads to changes in the teacher-training program.

181 Villegas-Reimers, Eleonora, and F. Reimers. 1996. "Where Are the 60 million teachers?" *Prospects* 26(3): 469–93.

This is an article on the Millennium Development Goals.

182 Vivancos, Jordi. 1997. "Implementing Information Technology in the Educational System. A Catalonia Perspective." *European Journal of Teacher Education* 20(1).

This paper deals with the development of ICT in primary and secondary education in Catalonia. The aspects of development presented and analyzed are teacher education: pre-service and in-service actions; and policies and organization.

183 Von Prummer, Christine. 1998. "Evaluation of Media and Technology at the German FernUniversitat." *Open Learning* (November): 59–65.

This article discusses examples of the evaluation of media and technologies used at the FernUniversitat (Germany) for distance education.

184 Wagner, E. D. 1997. "Interactivity: From Agents to Outcomes." In T. E. Cyrs, ed., *Teaching and Learning at a Distance: What it Takes to Effectively Design, Deliver, and Evaluate Programs*. San Francisco: Jossey-Bass Publishers: 19–26.

This paper discusses the value of creating interactive materials for distance-education courses. The author argues that interactivity keeps students interested and engaged and therefore maximizes the learning potential.

185 Watabe, Kazuo, M. Hamalainen, and A. B. Whiston. 1995. "An Internet-Based Collaborative Distance Learning System: CODILESS." *Computers in Education* 24(3): 141–55.

This article describes the objectives, conceptual model, and architecture of this project that aims to integrate synchronous and asynchronous multimedia communication with other resources.

186 Williams, C. 2000. *Distance Education and ICT: Teaching and Learning Online: A Literature Review*. Occasional paper, University of Brighton.

A United Kingdom-focused review of the literature on distance education and ICT with emphasis on the delivery of an online professional development program.

187 Willis, B., ed. 1995. *Distance Education: Strategies and Tools*. Englewood Cliffs, N.J.: Educational Technology Publications.

This is an introduction to the various technologies currently being used in and proposed for distance education. It explains the hardware, necessary lecturer training, advantages, and drawbacks inherent in each technology.

188 Wort, Michael. 1995. *The Promotion of Support Strategies for In-service Primary School Teachers in Tanzania through Distance Education. Dimensions of Development*. Uppsala, Sweden.

This book describes a teacher-education project in Tanzania and distance-education applications in the project.

189 Young, G., and D. Marks-Maran. 1998. “Using Constructivism to Develop a Quality Framework for Learner Support: A Case Study.” *Open Learning* (June):30–37.

This article analyzes the changes that took place in learning and teaching strategies at Thames Valley University (United Kingdom). The author identifies constructivist approaches to learning as particularly influential in the development of distance education and quality frameworks.

190 Zhoo, Y., and K.A. Frank. 2003. “Factors Affecting Technology Users in Schools: an ecological perspective”, *American Research Journal*, 40:4, 807–40.

Directed at provision of ICT for schools this analysis has general relevance to consideration of new technologies in all educational contexts.

191 Zvacek, S. M. 1996. *Distance Education in the Teacher Education Program of Zimbabwe*. Paper presented to the Annual Conference of the Association for Educational Communications and Technology, Des Moines.

This paper describes a project on distance education in Zimbabwe that identifies major project strengths and weaknesses and makes recommendations on a more active role for the University of Zimbabwe.

IX Glossary of Terms Used in the Toolkit

Asynchronous electronic conferencing: A conference or meeting that uses e-mail or similar software to allow several people to participate by posting messages at the convenience of each participant and over a period of time.

Broadcast media: In the context of open and distance learning, both television and radio are used to broadcast lessons and assignments over a vast area. Lessons are broadcast at regular, fixed times throughout the course, and sometimes telephones or other audio devices are used to allow interaction between instructor and learner.

Connectivity: The ability to access the Internet and World Wide Web either directly or through an Internet Service Provider (ISP).

Continuing professional development programs: Courses offered to in-service teachers that cover a wide range of needs and purposes. The length of courses vary markedly, and some programs may award formal qualifications at the conclusion of the training.

CD ROM (compact disc): Computer storage medium that contains a range of data stored digitally, such as words, graphics, and sounds. These can store up to 250,000 pages of text.

CMC: see **Computer-mediated conferencing**

Computer-mediated conferencing (CMC): Development of electronic mail that is designed to support group-to-group communication. Each conference comprises users who have a common interest in the conference subject matter.

Course: A course is a complete package of a teacher-training or education program that is offered to the teacher. It is often composed of smaller units like lessons and modules.

Design evaluation: An evaluation that takes place during the development or design stage of a course. Often this takes the form of a pilot program before a program is offered on a large scale. The purpose of this type of evaluation is to ensure that a course works in the way it is designed to before participants are enrolled.

Digital: In computing, information is represented as discrete digits or bits.

Digital versatile disc or Digital video disc (DVD): Data-storage disc that can store high-quality video and programs, text, images, and sound.

Distance education: "[A]n educational process in which a significant proportion of the teaching is conducted by someone removed in space and/or time from the learner" (Perraton 1993).

Dual-mode institution: An academic institution that provides tuition through conventional classroom learning and through open and distance-learning methodologies.

E-mail: Electronic mail. Messages are sent and retrieved in electronic form via computers.

Face-to-face tutorial support: Used in an open and distance-learning program when a tutor meets with a learner, or a group of learners, in person.

Fixed costs: Those costs required to develop and operate a learning system irrespective of the number of learners served. These include the investment costs of developing and distributing lessons, broadcasts, and software. They also include the administrative costs of the institution that organizes the learning.

Information and communication technologies (ICTs): Technologies that allow communication over space and time. This has become a popular term because of the remarkable speed and capacity with which the new digital technologies can transmit information.

In-service-qualification upgrading: Upgrading qualifications programs for in-service teachers, especially teachers with low-level qualifications or, in some instances, no post-secondary school qualification at all.

Interactive radio instruction: Instruction is delivered using radio to allow for interaction between the radio broadcast and the learners.

Internet: Also known as the "net," the intercommunicating computer networks, which host and provide access to the World Wide Web, file transfer, e-mail, news, and other services.

Local support: Support for participants enrolled in an open and distance-learning course that is provided near the participants' homes or workplaces. Local support can be organized on an individual or group level and can range from a phone call to a local tutor to a period in residence at a traditional teacher-education institution.

Marginal costs: The costs of adding an additional student to an education program or system.

Media: The different ways educational support materials can be delivered to individual learners. Different media span the spectrum from print to audio to video.

Module: A smaller part of a course, commonly consisting of a package of several credits, lessons, or activities. Usually a series of modules constitutes a complete course.

Open and distance learning: The open learning approach, when combined with distance-education methodologies, is often referred to collectively as open and distance learning.

Open learning: An educational approach, which focuses on "...the provision of learning in a flexible manner, built around the geographical, social and time constraints of individual learners, rather than those of an educational institution" (Bates 1995).

Opportunity cost: The cost of alternative methods or programs that might provide the same opportunities. For example, from the perspective of the student, enrollment in a distance-education program for teacher education is likely to save the costs of room and board and improve the opportunities for employment as a teacher.

Outcome evaluation: An evaluation of the outcomes of a particular course or program. The purpose of outcome evaluation is to evaluate whether, and how well, a course or program has achieved its objectives.

Outcomes-based assessment: A method of assessment based on the comparison between a participant's performance and a set of predetermined outcomes. Often this involves providing evidence that a participant can perform particular activities such as using group work effectively in the classroom.

Portfolio: A collection of work that shows the progression of a course participant over the duration of the course or module. Portfolios may include examples of pupils' work and commentaries by other teachers who observed the teacher implementing the activity.

Pre-service education and training: Any initial education and training of teachers prior to their full-time teaching. This usually takes place in colleges, universities, or other institutions of higher education; the level attained may be below degree standard.

Process evaluation: Process, or ongoing, evaluations are designed to ensure that the course is maintaining standards of performance and that it is meeting the needs and expectations of the participants. It can help

instructors and tutors improve the course and help course designers improve the course for future learners.

School-based activities: Activities that are carried out in the classroom, school, or in field work; they might involve pupils or other members of the staff.

School-level support: A component is built into an open and distance-learning program that focuses on providing support to the learner within the school itself. This can involve a formal mentoring program with experienced staff or simply the formation of a study group among teachers at a school.

Short messaging system (SMS): Electronic messages sent via cell or mobile phones.

Single-mode institution: An academic institution that provides tuition only through conventional classroom-based methodologies.

Stakeholders: People or organizations that have an interest in a specific activity or program.

Synchronous electronic conferencing: A meeting conducted using e-mail or similar software that allows several people to participate simultaneously in "real time."

Unit of cost comparison: A part of a program used as a basis of comparison with other programs. In open and distance learning, this is commonly the cost per student, although a more accurate measurement for quality purposes might be the cost per course completer or the cost per graduate.

Variable costs: Those costs depend directly on the number of learners in the system. These comprise facilities, books, and other materials. For example, the number of radios, televisions, and computers required by an individual program depends on the number of learners served.

World Wide Web (WWW): Or simply "the web." A distributed information service of linked documents on the Internet, which is accessed using a web browser such as Microsoft Internet Explorer or Netscape. On the web, any document can be linked to any other document.

(I) Selection of journals and newsletters relevant to open and distance learning and teacher education

American Educational Research Journal
http://www.aera.net/pubs/aerj/

American Journal of Distance Education
http://www.ajde.com/

British Educational Research Journal
http://www.bera.ac.uk/berj.html

British Journal of Educational Studies
http://www.blackwellpublishers.co.uk/asp/journal.asp?ref=0007-1005

British Journal of Educational Technology
http://www.blackwellpublishers.co.uk/asp/journal.asp?ref=0007-1013

Cambridge Journal of Education
http://www.tandf.co.uk/journals/archive/c-archive/cje-con.html

CIFFAD (France)
http://ciffad.francophonie.org/Nous-offrons/gravocor.html

ComLearn (Canada)
http://www.col.org/cl0695.htm

Computers in Education
http://home.gci.net/~kjf/emedia/

Datorn I Utbildningen
http://www.diu.se/nr5-99/nr5-99.asp?artikel=s10

Deanz Bulletin (New Zealand)
http://www.deanz.org.nz/news.htm (this is a bulletin or newsletter)
http://www.deanz.org.nz/jour.htm (this is a journal)

Deosnews (United States)
http://www.emoderators.com/papers/DEOSNEWS898.html
http://home.nettskolen.nki.no/~morten/DEOSNEWS/

Distance Education (Australia)
http://www.usq.edu.au/dec/decjourn/demain.htm
http://www.odlaa.org/pubs.htm

Distance Education Authority Newsletter (South Africa)
http://www.deasa.adm.br/internaa.htm

EADTU news (the Netherlands)
http://www.eadtu.nl/about/default.htm

EDEN Newsletter (United Kingdom)
http://www.dermis.net/org/eden/nl1_2.htm#kap3

Education, Communication, and Information
http://www.open.ac.uk/eci/

Educational Leadership
http://www.ascd.org/frameedlead.html

Educational Media International
http://susanna.catchword.com/vl=1528109/cl=26/nw=1/rpsv/catchword/routledg/09523987/contp1-1.htm

Educational Technology
http://www.fno.org/

European Journal of Teacher Education
http://www.atee.org/htm/ejte/ejtevl20.html

International Journal of Educational Telecommunications
http://www.aace.org/pubs/ijet/
http://www.aace.org/pubs/ijet/v2n4.html

Insights Education
http://www.id21.org/index.html

Journal of Computers in Mathematics and Science Teaching
http://www.aace.org/pubs/jcmst/v15n3.html

Journal of Curriculum Studies
http://www.edu.uwo.ca/jcs/

Journal of Distance Education (Canada)
http://ultratext.hil.unb.ca/Texts/JDE/

Journal of Education for Teaching
http://gort.ucsd.edu/newjour/j/msg01741.html
http://fernando.catchword.com/vl=3121070/cl=14/nw=1/rpsv/catchword/carfax/13600540/contp1.htm

Journal of IT in Teacher Education
http://www.triangle.co.uk/jit/

Journal for Teacher Development
http://www.triangle.co.uk/tde/

Journal of Teacher Development
http://www.triangle.co.uk/jit/

Journal of Teacher Education
http://www.ied.edu.hk/cric/new/apjted/index.htm

Media in Educational Development
http://www-jime.open.ac.uk/

ODLAA Times (Australia)
http://www.odlaa.org/pubs.htm

OLS (Open Learning Systems) News
(ISSN 0269-9729) (Quarterly with issues in June, September, December, and March.)
Subscription details from: OLS News, Subscriptions Dept., 11 Malford Grove, Gilwernm Abergavenny, Monmouthshire, NP7 0RN, U.K.

On Pirade (Solomon Islands)
PIRADE—Pacific Islands Association of Distance Education
Contact: President Ruby Vaa
vaa_r@usp.ac.fj

Online Chronicle of Distance Education (United States)
http://www-icdl.open.ac.uk/lit2k/external.ihtml?loc=http://www.nova.edu/fcae/disted/

Open Learning (United Kingdom)
http://www.baol.co.uk/oltabout.htm

Open Learning Update (Australia)
http://www.educationau.edu.au/archives/OLUP4/Index.htm

Open Praxis
(ISSN 0264-0210). Two issues per year, in April/May and September/October. First published in1993 as successor to ICDE Bulletin. Welcomes "articles, news items, letters, cartoons, and copies of publications for review from institutional and individual members of ICDE."
http://www-icdl.open.ac.uk/lit2k/journals.ihtml

Qualitative Studies in Education
http://gort.ucsd.edu/newjour/i/msg02652.html

Research in Distance Education
http://www.ihets.org/consortium/ipse/fdhandbook/resrch.html

Revista Iberoamericana de Education Superior a Distancia (Spain)
http://www.red-redial.org/revistas/revues_espagnoles/educacion/educ.htm

(II) Selection of open and distance-learning associations

African Council for Distance Education (ACDE)
website currently hosted at http://www.unisa.ac.uk/acde/

Association of Asian Open Universities (AAOU)
http://www.ouhk.edu.hk/~AAOUNet/

Association of European Correspondence Schools (AECS)
http://www.eadl.org/

Association for International Education (AIE, Russia)
http://www.civilsoc.org//nisorgs/russwest/moscow/aie.htm

Associazione Campo (Italy)
http://www.aen.at/partners/italy/campo/campo.htm

ATENA (France)
http://www.ethoseurope.org/ethos/partin1.nsf/2d3b5e66465767f580256887004bf310/b744133939949e72802563640060bde2?OpenDocument

Brasilian Association for Distance Education (ABED)
http://www.abed.org.br/

Canadian Association for Distance Education (CADE)
http://www.cade-aced.ca/

Consorzio Nettuno (Italy)
http://nettuno.stm.it/nettuno/index.htm

Danish Association of Open Universities (DAOU)
http://www.au.dk/daou/

European Association of Distance Teaching Universities (EADTU)
http://www.eadtu.nl/

European Distance Education Network (EDEN, United Kingdom)
Gratis. The newsletter of EDEN. Kerry Mann, Executive Secretary, EDEN, P.O. Box 92, Milton Keynes, MK7 6DX, U.K.

Finnish Association for Distance Education (FADE)
http://oyt.oulu.fi/fade/eng/fadeesc.htm

International Council for Distance Education
http://www.icde.org/

Istruzione a Distanza (IAD)
First published in 1989. Quarterly. The language of the journal is Italian but coverage is international. Subscription details from: Istruzione a Distanza, Piazza San Carlo III, 42 I-80137 Napoli, Italy.

National Council for Distance Education (Hungary)
http://www.fsz.bme.hu/lnokt/ntt/ntt_eng.htm

Norwegian Association for Distance Education (NADE)
http://www.nade-nff.no/nade-nff/nadeindx.html

Open Learning Foundation (United Kingdom)
http://www.olf.ac.uk/

Swedish Association for Distance Education (SADE)
http://www.mh.se/sverd/english.html

The Inter-America Distance Education Network
http://www.cde.psu.edu/DE/CREAD/Cread.html

(III) Selection of relevant websites

The Commonwealth of Learning (COL)
The Commonwealth of Learning is an international organization that helps develop and distribute open learning and distance-education resources technologies. COL is helping developing nations improve access to quality education and training.
http://www.col.org/

Communication Initiative
Goals are to improve strategic thinking on development issues and advocate the importance of communication for sustainable development.
http://www.comminit.com/

Distance Education Clearinghouse (University of Wisconsin-Extension, United States)

A collection of resources for distance education that includes a section giving current information about distance education (list of conferences, articles, bibliographies, online discussion groups, etc.) as well as a section for people new to distance education.
http://www.uwex.edu/disted/

Digital Education Enhancement Project

British Department of International Development (DFID) funded research project investigating the use of state-of-the-art digital technologies in South Africa and Egypt.
http://www.open.ac.uk/deep

Education.Au Limited (Australia)

A national ICT agency for education and training.
http://www.educationau.edu.au/

Global Development Learning Network

The Global Development Learning Network uses distance-learning technologies and methods to facilitate interactive, cost-effective learning and knowledge sharing for sustainable development and poverty reduction.
http://www.gdln.org/

Imfundo

Project of the British Department of International Development (DFID) that is concerned with the development of information technologies to support education in Africa, with teachers as its primary target. Its website has a resource bank of information.
http://www.imfundo.org.

The International Council for Distance Education (ICDE)

ICDE is an international association of distance educators organized in 1938 that hold conferences around the world. Their site has lists of global distance-education associations that are affiliated with ICDE.
http://www.icde.org/

International Research Foundation for Open Learning

The International Research Foundation for Open Learning (IRFOL) is a specialist research agency that carries out research to guide policy on ODL. Its work concentrates on basic education, higher education, and the education of teachers. It works mainly, though not solely, in developing countries in association with partner institutions and researchers there.
http://www.col.org/irfol/

The Open University International Centre for Distance Learning (ICDL, United Kingdom)

Database of distance-learning courses and institutions and extensive literature database.

http://www-icdl.open.ac.uk/

The Open University Centre for Research and Development in Teacher Education

CReTE has research and development projects in a number of countries including Albania, Egypt, South Africa, and the United States.

http://www.open.ac.uk/education-and-languages/centres/crete

Remote Village Project

Example of research project on low-cost sustainable computer technology. Remote IT Village Project responds to villagers' expressed needs for telecommunications, business opportunities, and enhanced education for children through the development of a solid-state, low-wattage computer that can be powered by a foot-crank, a high-bandwidth wireless network, and support for village small businesses.

http://www.jhai.org/jhai_remoteIT.html

Soul Beat Africa

Website for communicators across Africa to share experiences, materials, strategic thinking, and events, and to engage in discussion and debate. Addresses communicators, practitioners, media personnel, academics, researchers, and others who are interested in communication for change in Africa.

http://www.comminit.com/africa/

South African Institute for Distance Education (SAIDE)

The South African Institute for Distance Education's purpose is to assist in the reconstruction of education and training in South Africa. It promotes open learning principles, the use of quality distance-education methods, and the appropriate use of technology. Through its information services it provides on-line access to newsletters and a wealth of information in the Reading Room.

http://www.saide.org.za/

TechKnowLogia

Free bimonthly newsletter on the use of information and communication technologies in education, produced by an American agency, Knowledge Enterprise, Inc.

http://www.TechKnowLogia.org.

UNESCO Education

It contains a variety of material on teacher education and the use of distance education.
http://www.unesco.org/education/portal/e_learning/index.shtml.

UNICEF

It contains articles, opinions, and research relevant to the needs of teachers.
http://www.unicef.org/teachers/build.htm.

University of Wisconsin – Extension Distance Education Clearinghouse

Comprehensive review of all aspects of distance education, including journals, relevant conferences, and contemporary issues.
http://www.uwex/disted/

WorldBankGlobalDistanceEducationNet

The Global Distance EducationNet (Global DistEdNet) is a knowledge guide to distance education designed to help clients of the World Bank and others interested in using distance education for human development. The Network consists of a core site located at the World Bank and regional sites in all parts of the world.
http://www1.worldbank.org/disted/

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The global community has set a millennium development goal that by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling. In Sub-Saharan Africa this is a daunting challenge. Expanding provision requires millions of new teachers and upgrading millions more of unqualified and underqualified teachers already working in schools. Unqualified teachers may require emergency school based training programs whilst they await the opportunity to take regular accredited courses. This comes at a time when pressure on the teaching workforce is great. New types of jobs in the expanding knowledge economy are attracting many who would traditionally have become teachers. HIV/AIDS is impacting on the teaching forces of many countries. Teachers are less attracted to working in rural communities. In this context, the education and training of new and existing teachers becomes a top priority. New, school-based programs of teacher education using distance learning and information and communication technologies (ICTs) may be the only logistically feasible and economically sound means of educating the millions of unqualified and underqualified teachers within the primary sector.

This toolkit Designing Open and Distance Learning for Teacher Education in Sub-Saharan Afric is the third in a series of recent publications by the Africa Region Human Development Department of the World Bank to share knowledge and experience on how distance education and ICTs can support education in Africa. The publication addresses the key issues in program development. The authors are international experts in this field with extensive research and development experience in Africa. They set out a structured approach to program design drawing on extensive examples from within the continent and the broader international community. The toolkit presents the very latest thinking in the field, including detailed exploration of the possibilities of information and communication technologies.